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ShopNotes®

Vol. 16 Issue 93

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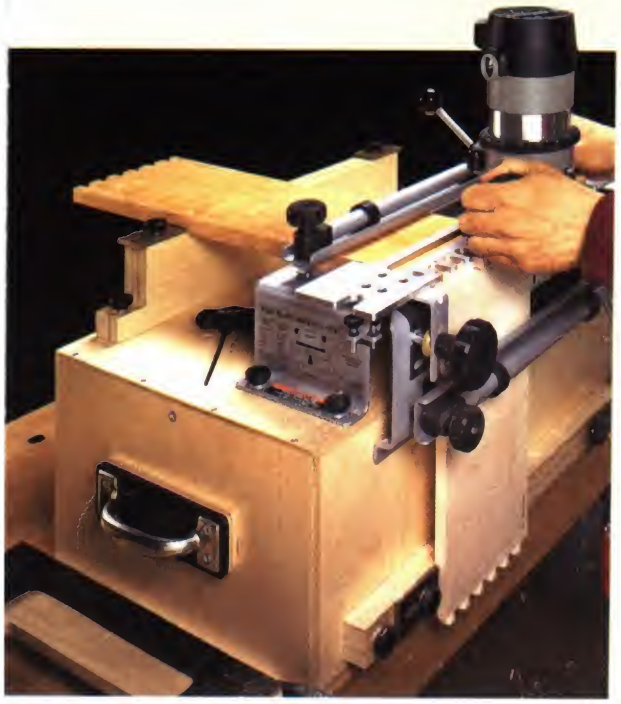

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Cutoffs

The weather is getting warmer and the days are getting longer. It's the time of year when many people start thinking about home improvement projects — I know I am. But in my case, I'm really thinking — shop improvement.

And I can't think of a better way to upgrade the shop than with a few easy-to-build projects. For starters, take a look at the plywood projects featured on page 16.

You'll find five projects in all: a lumber rack, a folding assembly table, a roll-around cart, a pair of stacking storage units, and a versatile sawhorse system. Any one of these projects would be a welcome addition to any workshop. But the best part is, each one can be built quickly and easily using just a single sheet of plywood. So you don't have to invest a lot of time or money to improve your shop.

Of course, improvement projects aren't the only things on people's minds this time of year. Spring cleaning and clearing the clutter are high on the priority list.

With that in mind, be sure and check out the article starting on page 44. There you'll find six simple ideas to help keep your clamp clutter under control.

And to satisfy the urge to clean, take a look at page 42. You'll find an easy way to get more life from your table saw blades.

Terry

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from our Readers

Tips for Your Shop

Quick Clamp Sanding Block

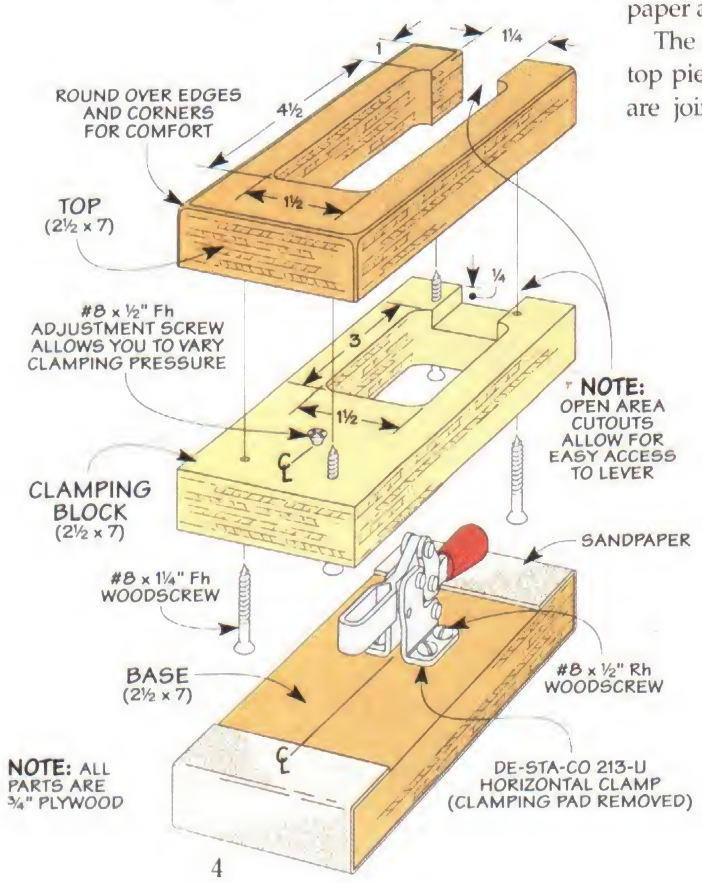
Sanding blocks are ideal for smoothing out rough areas of a workpiece. But the problem with most sanding blocks is they're often too small to give you a good grip and it can be difficult to change the sandpaper. To solve this problem, I built the sanding block shown in the photo above. It fits comfortably in your hand. And it uses a toggle clamp to sandwich the sandpaper tight in the block.

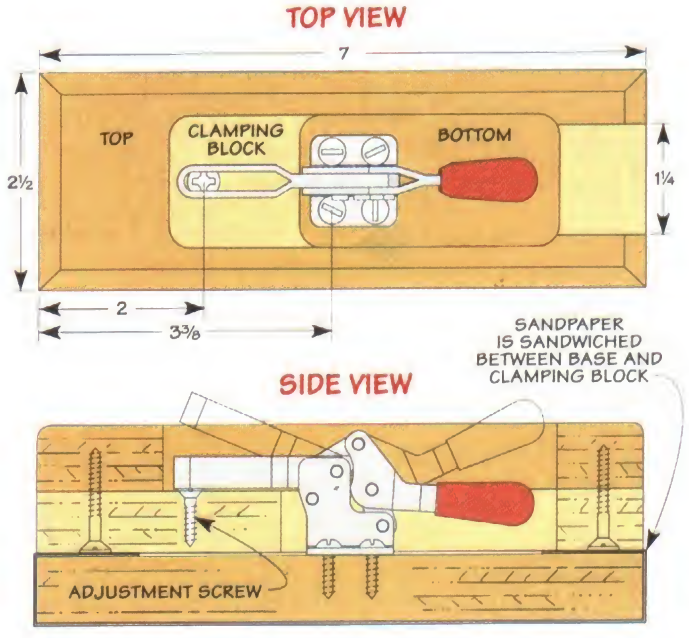
The sanding block is made from ¾" plywood. As you can see in the drawings below, it consists of three layers. The base holds the sandpaper and the toggle clamp.

The middle clamping block and top piece that form the hand grip are joined together with screws. They each have a cutout in the center for the toggle clamp. And the clamping block has a "shelf" area for the head of the clamp to provide adequate pressure.

Now using and changing sandpaper is easy. Just release the toggle clamp to remove used sandpaper and replace it. Then simply snap the sanding block back together.

Mark Thiel
Coral Springs, Florida





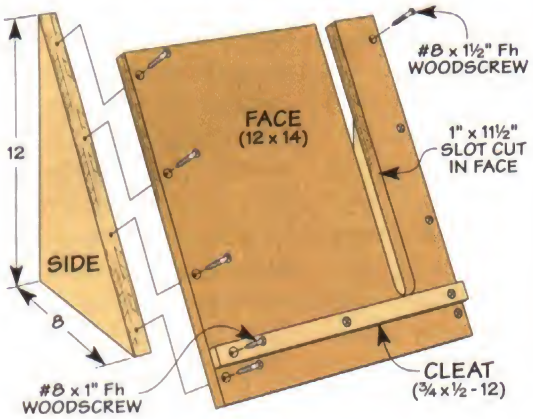
Circular Saw Storage Caddy

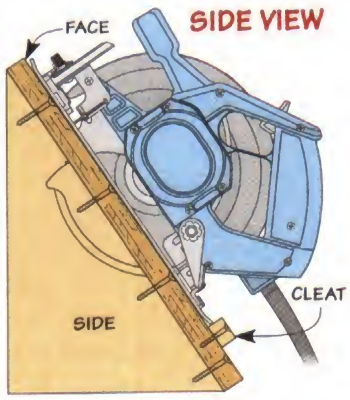
Storing a circular saw is a hassle in my shop. I want it to be easily accessible, but it doesn't fit neatly on a shelf or in a cabinet. To get around this problem, I built the storage caddy shown in the drawing below.

The caddy is designed to sit on a shelf, as you can see in the photo at right. The face has a notch cut from the top for the blade guard of the saw. A cleat near the bottom of the face supports the saw in position. The face is screwed to two triangular-shaped end pieces. This way, the saw can be easily stored on a narrow shelf with the cord tucked neatly beside it.

Now storing my circular saw is no problem. And whenever I need to use it, it's always within reach. All I need to do is grab it by the handle, slip it out of the slot, and it's ready for use.

Jared D. Huber
Appleton, Wisconsin





Submit Your Tips

If you have an original shop tip, we would like to hear from you and consider publishing your tip in one or more of our publications. Just write down your tip and mail it to: *ShopNotes,* Tips for Your Shop, 2200 Grand Avenue, Des Moines, Iowa 50312. Please include your name, address, and daytime phone number (in case we have any questions). If you would like, you can FAX it to us at 515-282-6741 or visit our website at *www.ShopNotes.com*. We will pay up to $200 if we publish your tip.

The Winner!

Congratulations to Angelo Tsarpalas of Glenview, Illinois. His design for the I-beam sawhorses (page 6) was selected as winner of the *Porter-Cable* router just like the one shown at the right. These sawhorses may be light in weight, but can stand up to the most demanding tasks in the shop.

To find out how you could win a *Porter-Cable* router check out the information above. Your tip just might be a winner.

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I-Beam Sawhorses

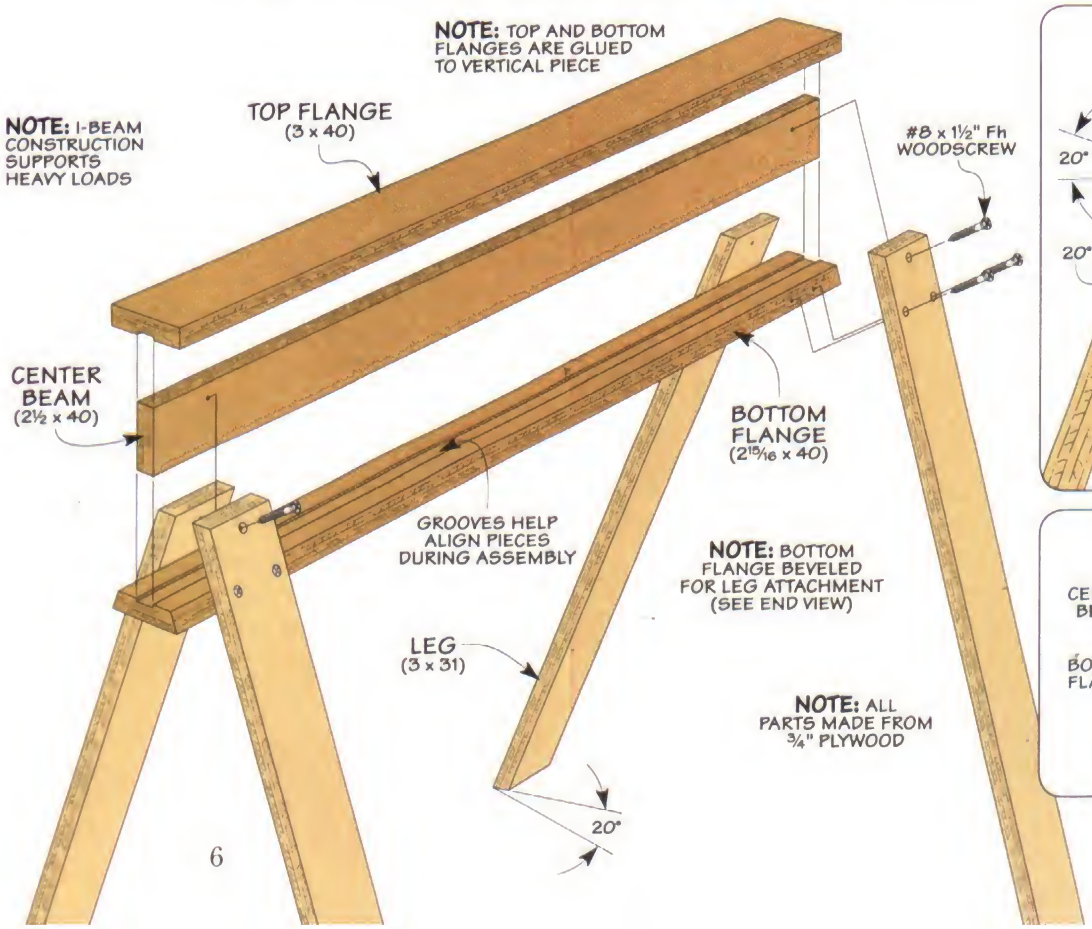
I build a lot of heavy furniture and cabinets in my shop. And sawhorses are the best way to get these large projects up off the ground so I can easily work on them.

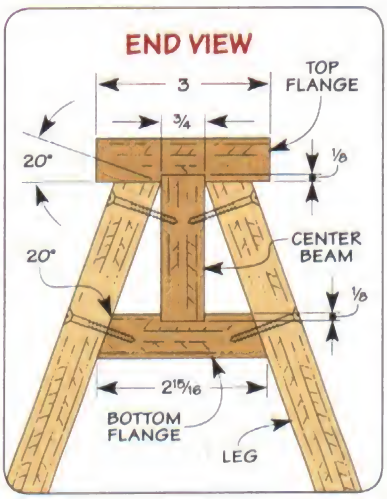
What I needed was a sawhorse that would be lightweight and easy to move around yet sturdy enough to hold large projects. To ensure my sawhorses would always be up to the task, I built the ones you see above. Even though they don't *look* heavy-duty, they support a lot of weight.

Their strength and light weight comes from the I-beam design. As you can see in the drawings below, the top and bottom flanges of the beam are nothing more than two long pieces of plywood with a groove centered in each piece. (The bottom flange is beveled, as shown in the End View below.) Then, a vertical center rail is glued into the grooves to complete the sturdy I-beam assembly.

The legs are ¾" plywood with their ends beveled and then attached to the I-beam with screws. Their angled stance provides a wide base for greater stability.

Angelo Tsarpalas
Glenview, Illinois





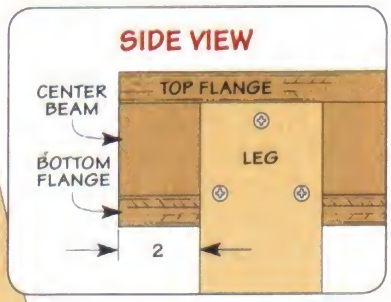


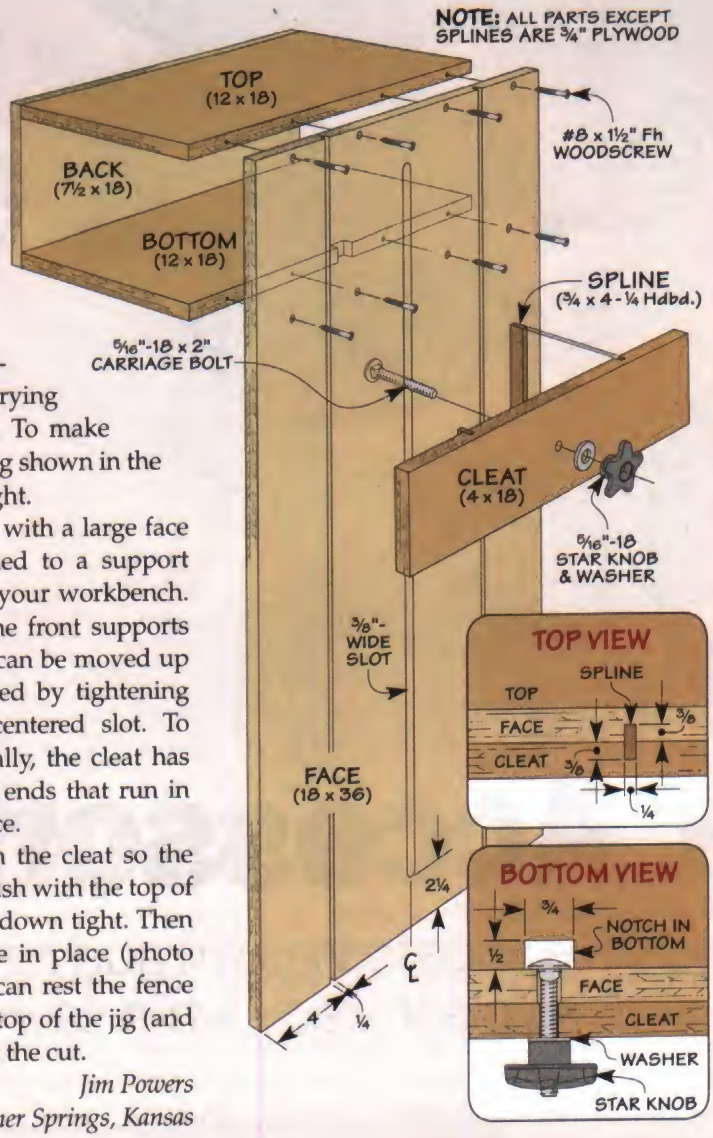
Plate Joiner Cabinet Jig

The plate joiner in my shop gets a lot of use for joining cabinet parts. But it's always tough to support and hold the large workpieces (like cabinet sides) in place while trying to make an accurate cut. To make this job easier, I built the jig shown in the photo and drawings at right.

The jig is simply a box with a large face piece. The face is attached to a support assembly that clamps to your workbench. An adjustable cleat on the front supports the workpiece. The cleat can be moved up or down and then secured by tightening a plastic knob in the centered slot. To keep it aligned horizontally, the cleat has hardboard splines at the ends that run in shallow grooves in the face.

To use the jig, position the cleat so the top of the workpiece is flush with the top of the jig and lock the cleat down tight. Then just clamp the workpiece in place (photo at right). This way, you can rest the fence of the plate joiner on the top of the jig (and workpiece) while making the cut.

Jim Powers
Bonner Springs, Kansas



Quick Tips

▲ *A mirror placed behind the chuck makes it easy for* ***Serge Duclos*** *of Delson, Quebec, Canada to accurately position the bit without bending or stooping when drilling holes at his drill press.*

▲ ***Chuck Dart*** *of Bentonville, Arkansas slips a pad of synthetic steel wool onto the base of his palm sander whenever he has a tough cleanup or sanding job on metal or wood surfaces.*

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top 10 hand-held Router Accessories

These inexpensive accessories will add new capabilities and more accuracy, while saving time.

Flip through the pages of any woodworking catalog and you're sure to find several pages filled with router accessories. Most of them are billed as "must-have" items guaranteed to make you a better woodworker — *if* you can believe all the hype.

To help you sort out what you need and what you don't, I've gathered up 10 of the most useful accessories to help you get more from this versatile power tool. One very important thing to point out is that not all of these accessories are flashy, high-dollar items. In fact, most of these handy add-ons are less than $30 apiece. Take a look at page 51 for sources.

Set-Up Gauge. *This stepped gauge makes quick work of accurately setting the depth of cut on your router.*

ALTERNATE BASES

One way you can dramatically add capability to an ordinary fixed-base router is to upgrade the base. Many router models are designed to fit optional D-handle and plunge-style bases.

D-handles. At first glance, a D-handle base (photos on this page) may not seem like it's much of an improvement over a typical fixed base. But there are some advantages that I'd like to point out.

The first is the power switch is located in the D-handle. This trigger-like switch makes it a snap to turn on the router without having to take your hand off a handle.

I've also found a D-handle to be more comfortable to grip than two small knobs during extended use. One reason for that added

comfort is the shape of the D-handle places your arm in a more relaxed, pushing position.

Plunge Base. The other common base option is a plunge base, as you can see in the photo at right. You'll find that getting a plunge base is like adding a second router to your workshop.

With this base, you can tackle tasks like stopped dadoes, grooves, and mortises with ease. One feature that I really like is how simple it is to use multiple passes to make deep, accurate cuts.

There's one other benefit from getting either a D-handle or plunge base. You can use either one for all your hand-held routing tasks and attach the fixed base to your router table. This makes switching between the two hassle free.

SELF-CLAMPING GUIDES

Routing dadoes and grooves with a straight bit is a common hand-held router task. And the key to getting an accurate cut is guiding the router. To do that, I turn to a self-clamping, straightedge guide (main photo on the opposite page).

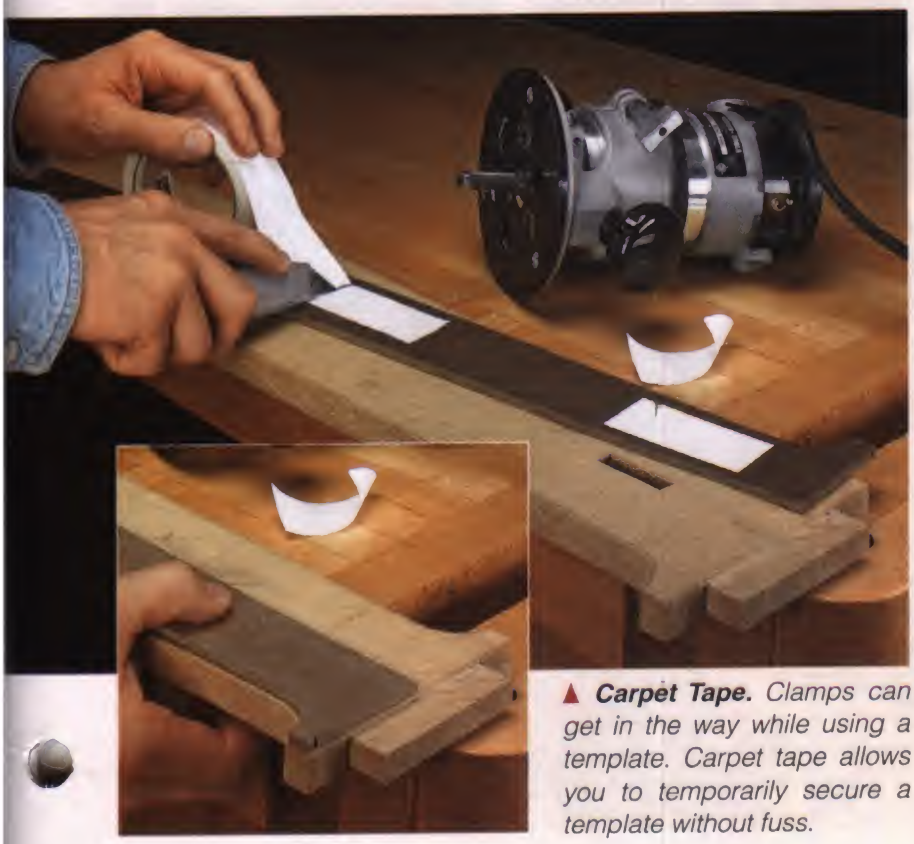
The Right Size. This aluminum guide comes in a variety of lengths (up to 144"). But I've found that a two-foot model takes care of most of my needs. The guide clamps to a workpiece with a cam clamp and a sliding jaw. And the smooth aluminum sides provide a dead straight reference for your router.

Using the Guide. The guide provides an accurate edge, but you still need to account for the offset of the bit from the reference edge. That's why I made a simple gauge block, as shown in the main photo on the facing page. (You'll need to make one for each bit size.)

To use the block, all you have to do is align the notch with the layout line, butt the guide to the end of the block, and clamp it down. Now you're ready to start routing.

LOW-COST ACCESSORIES

Something I've noticed about working with a router is that small details can make a big impact on the quality of the work. And these next two accessories fall into that category. They don't cost much,



▲ ***Carpet Tape.*** *Clamps can get in the way while using a template. Carpet tape allows you to temporarily secure a template without fuss.*

▲ ***Plunge Base.*** *With an auxiliary plunge base, you can leave the standard base attached to your router table for fast changes between setups.*

but can really make routing more accurate and safer.

Depth Gauge. An important part of using your router is accurately setting the bit depth. For years, I used a combination square. But eyeballing the bit against the ruler can be a challenge. So I picked up a simple, set-up gauge (lower photo on the opposite page). To use it, move the bit up or down until it makes contact with the stepped profile of the gauge.

Carpet Tape. All of the items that I mentioned so far are dedicated router accessories. So the carpet tape shown at left might not seem like an "accessory" at first. However, once you use it, it's sure to find a permanent place in your router cabinet.

One of the ways I use carpet tape with my router is flush trimming a workpiece with a template. Ordinary clamps often get in the way while routing and the template can shift when you reposition the clamps. But a few strips of carpet tape can provide just enough "clamping power" to hold the template in place while I trim the workpiece to size.

The accessories shown here are just a few ways to add new capabilities for your router. Turn the page to learn about six more.

six more must-have Accessories

The alternate bases and accessories featured on the previous pages will no doubt make a big difference in how you work with your router. But on these two pages, I want to highlight a few other well-used upgrades from my shop you may want to consider.

EDGE GUIDE

The self-clamping straightedge I mentioned earlier works great for routing dadoes across a panel. But for making grooves on long or narrow pieces, you'll need a different solution — an edge guide.

An edge guide is just a fence and a pair of rods that attach to your router like you see in the photo above. You set the position of the bit using the adjustable fence that rides along the edge.

Auxiliary Fence. For my edge guide, I attached a hardwood face to the fence. This gives the edge guide a wider bearing surface, which gives me more control at the start and end of a cut.

Edge Guide. *Routing perfectly parallel flutes is no problem with a simple edge guide attached to your router.*

OFFSET BASEPLATE

Speaking of greater control, this next add-on is all about giving you more stability when using a bearing-guided bit. The problem with an ordinary baseplate is that less than half the router is supported as you rout. This can make a large router feel tippy — especially as you near a corner.

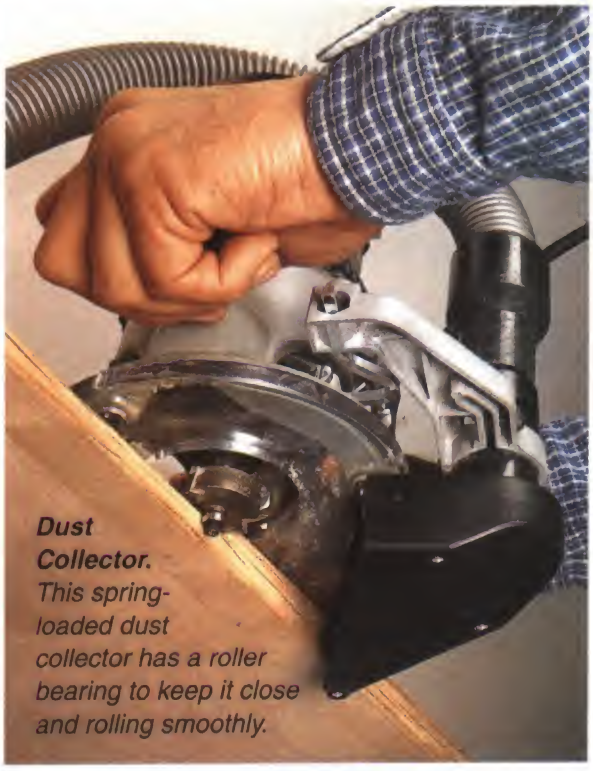
Control. In the lower left photo, you can see how I've added a teardrop-shaped baseplate. The extra length and additional knob improve the stability and control as I work. Plus, you're less likely to tip the router and spoil the cut.

ROUTING MAT

There's another problem you can run into when routing along the edge of a piece. And that's holding the workpiece in place. If you use clamps, you'll have to reposition them during the process.

A better solution is a routing mat (left photo below). It looks like a heavy-duty shelf liner with a textured rubber surface that gives it a surprisingly secure grip.

Offset Baseplate & Router Mat. *This large baseplate offers tip-free control while routing profiles. And the textured mat provides a solid grip on the workpiece.*



Dust Collector. *This spring-loaded dust collector has a roller bearing to keep it close and rolling smoothly.*

Not only does it act like a clamp, but it also makes repositioning the workpiece a snap.

There is one downside. Fine dust and chips can decrease the grip of the mat over time. But you can make it as good as new with a little maintenance. Simply rinse it off with warm water and let it dry.

DUST COLLECTOR

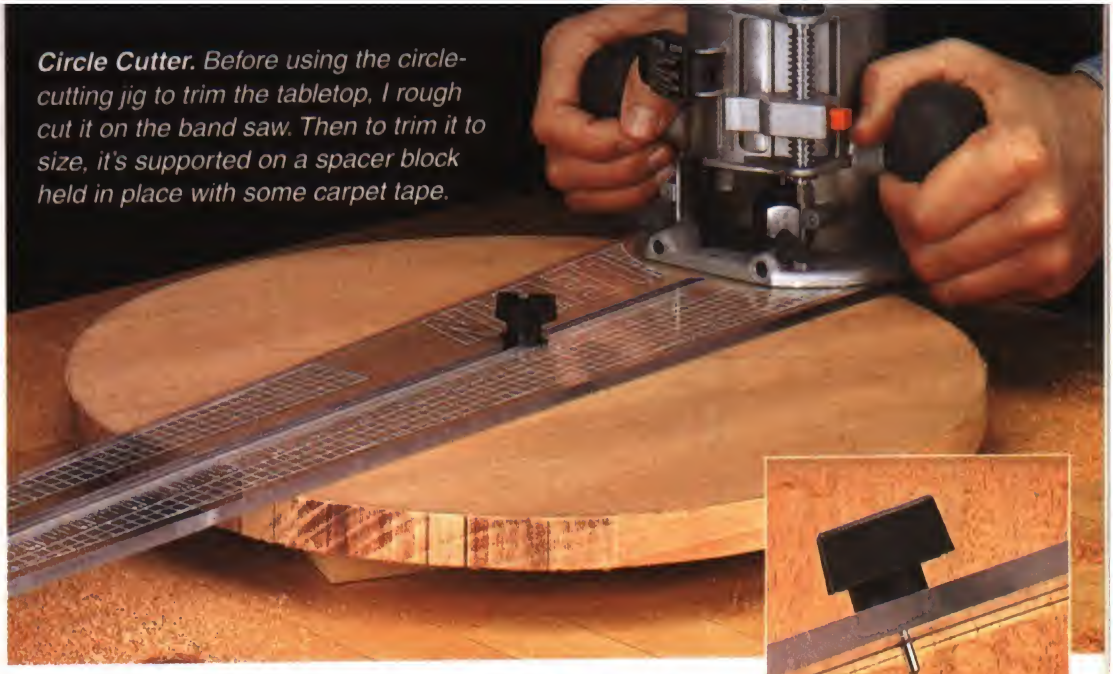
Anyone who has worked with a router knows just how much dust and chips it can produce. But trying to control the dust and chips can sometimes seem like raking leaves in a windstorm.

The dust collector shown in the lower right photo on the facing page is a great way to tame the dust clouds. (This collector is designed only for edge routing.) What I like about it is that the dust pickup is spring-loaded so it rides right along the edge of the piece. (Similar designs are available from other manufacturers.)

CIRCLE-CUTTING JIG

So far, we've talked about a few of the operations that I use my router for regularly — joinery, template routing, and edge profiles. But there are a couple of other tasks where I rely on my router. The first one is cutting a workpiece perfectly round. For example, making round tabletops (photo above).

Here again, the challenge is controlling the router. The solution is a circle-cutting jig (trammel). In the inset photo at right, you can see that the router rotates on a pin that fits in a hole drilled in the workpiece. A slot in the baseplate allows you to set the radius of the cut based on the location of the pin. To rout the table top, set the router to take a light ($\frac{1}{16}$") cut. Then move the router counterclockwise.



Circle Cutter. *Before using the circle-cutting jig to trim the tabletop, I rough cut it on the band saw. Then to trim it to size, it's supported on a spacer block held in place with some carpet tape.*

▲ ***Pivot Pin.*** *Drill the hole for the pivot pin in the bottom of the tabletop where it won't be seen.*

GUIDE BUSHINGS

Earlier, I mentioned routing with templates. There, I used a flush-trim bit to make the cuts. But there's another way to make templates work for you — guide bushings.

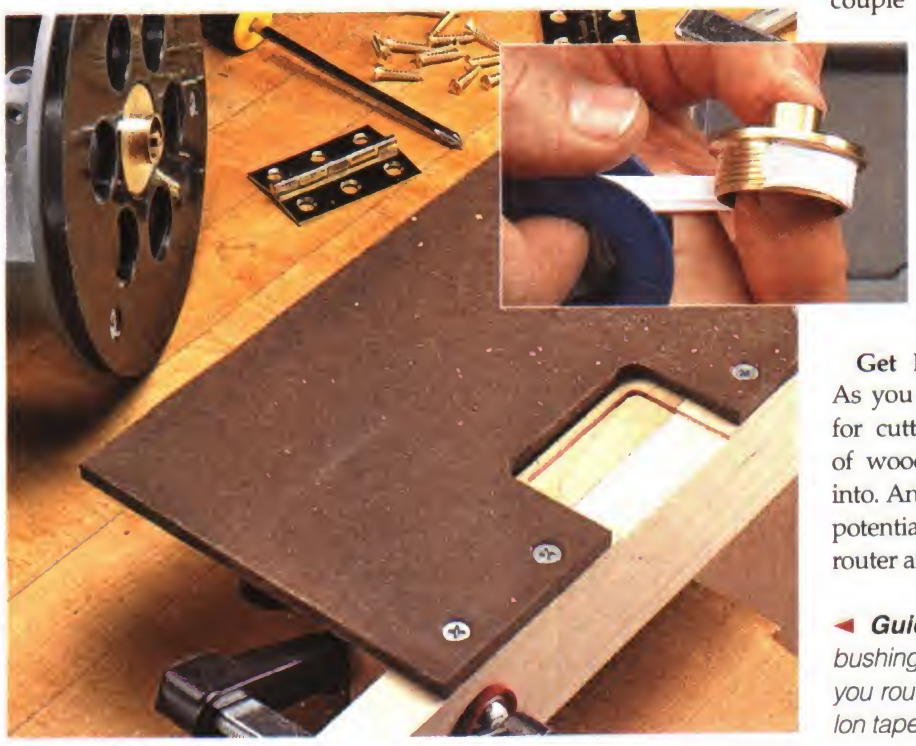
These metal collars mount in the baseplate of your router to control the bit. This lets you use almost any kind of non-bearing bit to do the cutting. For example, in the photo at left, I'm using a straight bit to rout a mortise for a butt hinge.

Although guide bushings are pretty simple to use, there are a couple things to keep in mind.

First, the bushing is larger than the bit, so you'll need to account for this offset when making the template.

Second, it's a good idea to get brass bushings. The softer metal won't damage a bit in case of accidental contact.

Get More From Your Router. As you can see, a router isn't just for cutting profiles. There's a lot of woodworking potential to tap into. And all it takes to unlock that potential and get more from your router are a few accessories.



◀ ***Guide Bushing.*** *To keep a bushing from working loose while you rout with a template, wrap Teflon tape around the threads (inset).*

the spin on Lazy Susans

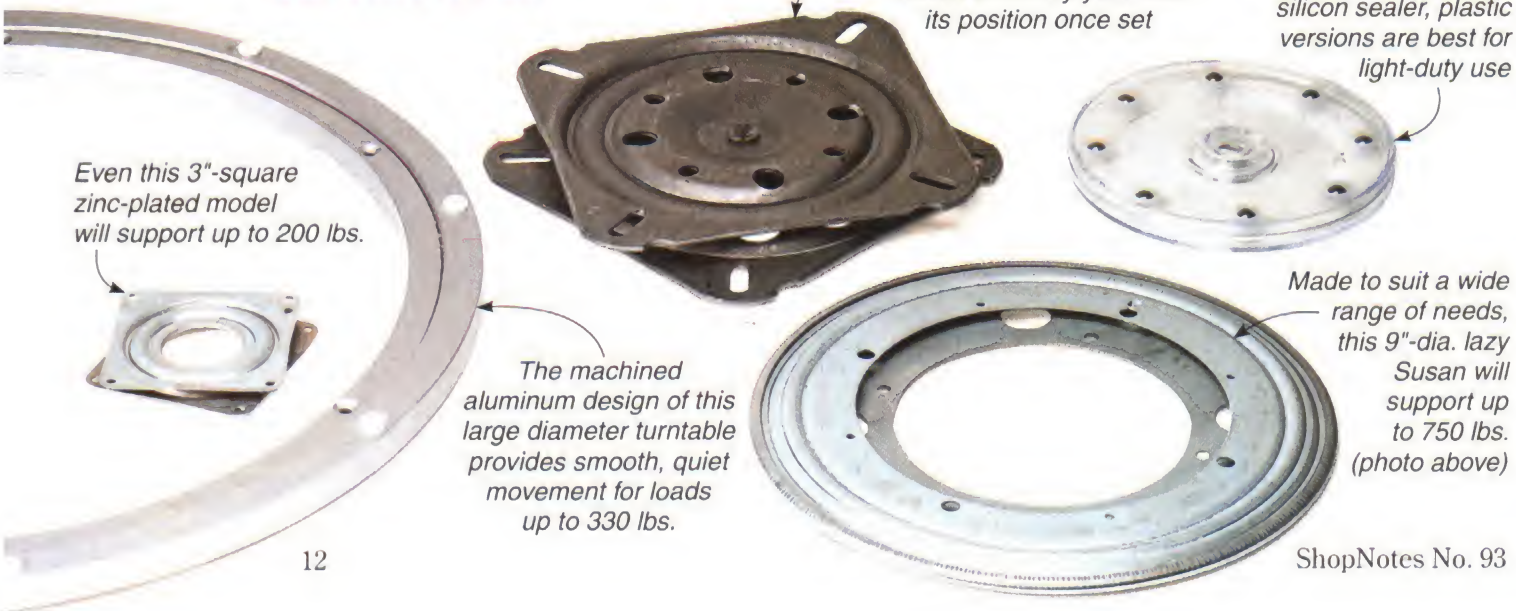
Get more out of your shop with this handy piece of hardware.

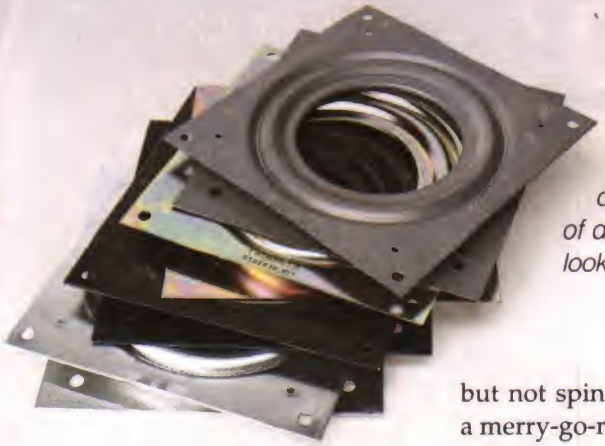
Getting the most out of the limited space in a shop or simply making it easier to accomplish a task is something just about every woodworker needs. A handy solution to some of these problems is an ordinary lazy Susan, like the one used in the finishing turntable above.

Since a lazy Susan moves quite freely with little to no resistance, a push with your finger provides all the effort necessary to move even heavy objects. This way, you can work in a small area and still have easy access to all parts of a project. Plus, it's the perfect way to get more out of a hardware storage cabinet or assembly table. You can even use one inside a cabinet to make better use of the space.

A Wide Variety. Before you can use a lazy Susan (or turntable) on a project, you'll need to pick one to suit the task at hand. And as you can see in the photos below and at the top of the opposite page, lazy Susans come in a wide range of styles, sizes, and materials. So you won't have any trouble finding one to meet just about any need.

LAZY SUSAN STYLES





◄ ***Finish Variety.*** *Although most often hidden, lazy Susans do come in a number of different materials and looks to suit the needs of your project.*

The small plastic models (4" to 9" in diameter) will only handle light weights (20-40 lbs.). That's why I typically use the zinc-plated circular and square versions. The small ones (3") will support up to 200 lbs., while the larger models allow easy rotation for loads up to 1000 lbs. (Sources on page 51.)

Keep in mind that a lazy Susan works best when the weight is centered. So even though a small turntable may support the load you have, a larger version will work better for off-center loads.

Design Options. Although most often associated with their free-wheeling action, some lazy Susans have added features to better suit your needs. These models feature detents that allow you to swivel the unit and "lock" it in place at a specific spot, like every 90°. Other models have a built-in stop. This allows you to rotate it 360° in either direction, but not spin it continuously like a merry-go-round.

If the stops or detents don't work for what you have in mind, take a look at the heavy-duty swivel on the opposite page. While it still moves smoothly, it's designed to stay fixed right where you position it until you're ready to rotate it again.

Installation is the Key. Because a lazy Susan is most often sandwiched between two workpieces, it looks to be impossible to install. But don't worry. The secret to the installation is nothing more than a small access hole in the bottom part of the assembly.

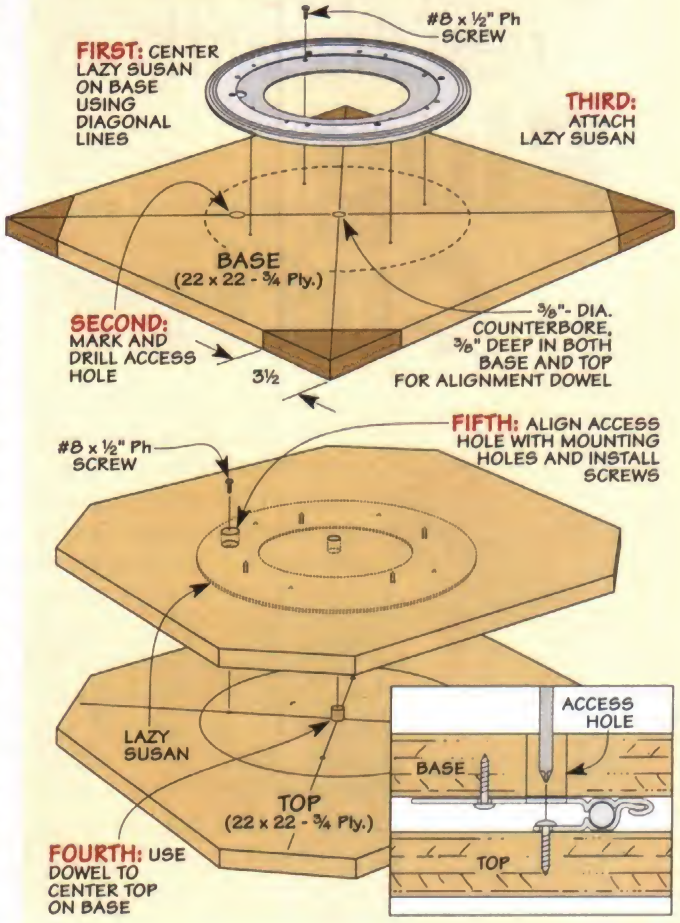
You can see what I'm talking about on the finishing table shown in the box at right. The drawings cover the basic process for installing just about any type of lazy Susan you find.

Once you understand the process, I think you'll find many ways to adapt a lazy Susan to enhance any small cramped workspace. For another solution to this problem, check out the box below.

Installing a Turntable

The trick to installing a lazy Susan, or turntable, is a little advance work. And that's just a matter of drilling a small access hole, as shown in the drawing below.

To do this, center the lazy Susan on the base, mark where the hole needs to be, and drill the hole. Then screw the lazy Susan in place. Finally, set this assembly in place on the top so it's centered and attach the lazy Susan using the access hole.



Heavy-Duty: Roller Bearings

Lazy Susans are a great solution to many shop needs. But if you have a large project, with loads that may not be evenly distributed, you may want to consider using heavy-duty roller bearings instead (photo at right).

By using several roller bearings you can build your own lazy Susan. And as shown in the far right photo, roller bearings are perfect for large projects that need to support heavy, asymmetrical loads.

Each roller bearing consists of a single large ball bearing supported by smaller bearings inside. This gives the roller a smooth, even motion while handling large loads better. (Sources on page 51.)

► ***Versatility.*** *A series of heavy-duty roller bearings supports the storage turntable in the base of this tool station as well as the benchtop tool carousel that rests on top.*

getting great results with a Plug Cutter

For projects assembled with glue and screws, I like to hide the screwheads with wood plugs. However, most store-bought plugs are cut from dowels. The visible end grain soaks up stain like a sponge, making plugs very noticeable. Face-grain plugs are less noticeable, but hard to match the grain and color of the wood.

The best solution I've found is to make my own face-grain plugs, using cutters like you see pictured here. Making your own plugs allows you to use the same wood as your project, which helps the plugs "disappear."

Plug cutters come in a range of sizes. The most common sizes range from ⅜" to 1" in diameter but can go up as large as 3".

STRAIGHT CUTTERS

Straight cutters are the most common and give you a plug with a consistent diameter (drawing on opposite page). They come in two designs — cylindrical and fluted.

Cylindrical. The cylindrical cutter (far left photo below) works well for cutting plugs. Its knifelike cutting edge slices through wood smoothly, with little chipout, heat buildup, and vibration.

Not only does this cutter come in various diameters, but cuts a range of lengths too (up to 2").

Fluted. The other design for a straight cutter uses four cutting legs called "flutes" (similar to the center cutter pictured below). Each of these flutes has a cutting edge that aggressively cuts through the workpiece. They do a great job when sharp. But when the flutes start to dull, they can mangle the wood, which can lead to plugs that aren't perfectly round. The plugs then fit poorly in the hole, there are gaps around the edges, and even the sides get a little burnt.

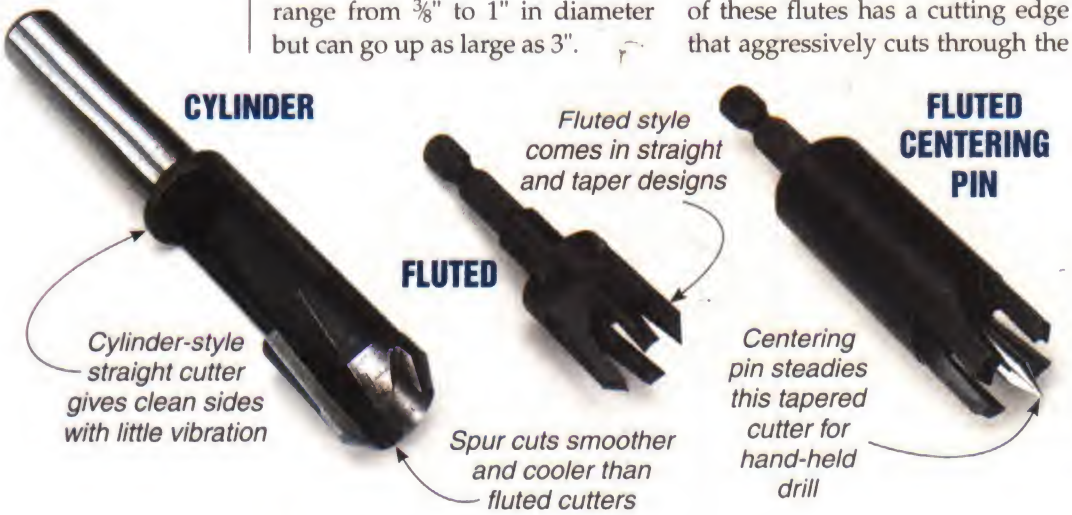
That's why I prefer to use cylindrical-styled cutters when I use straight plugs for my projects. It simply produces a better-fitting straight plug. However, no matter which design of cutter you use, any runout on your drill press will affect the diameter of the plug, resulting in chipout and visible gaps around the edges.

TAPERED CUTTERS

So, to solve those problems, I use tapered plugs most of the time for a couple of reasons.

The first is that a tapered plug can be tapped into a hole for a snug fit, with no visible gaps around the edges. The second reason is that a tapered cutter leaves very little chipout along the sides of the plug. This reduces the chance of seeing a gap around the edges too.

Tapered cutters only come in the fluted design. Although it looks similar to the straight one, it cuts

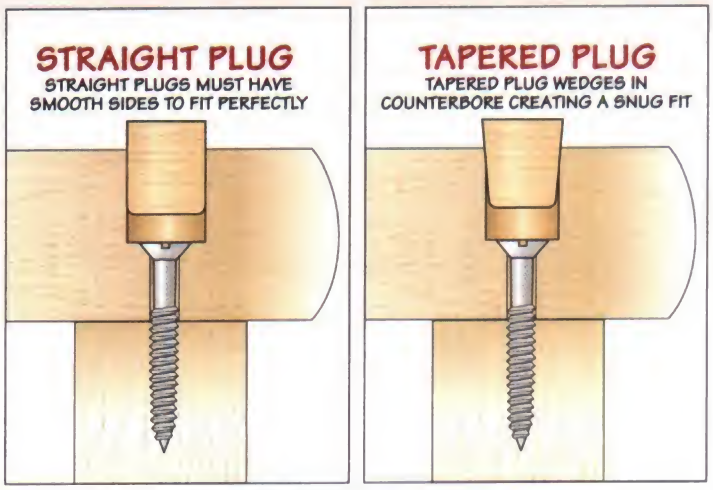


a plug with slightly angled sides (second drawing at right).

Wide to Narrow. The flutes taper to the inside. So, as the cutter works its way into the workpiece, the cutting edges carve the plug's diameter into a slight cone shape.

Centering Pin. One of the problems with plug cutters is their tendency to "wander" when they first start cutting. This wandering makes it necessary to use a drill press to get the best results. However, a new design from *Montana Brand* changes that (refer to Sources on page 51).

Protruding from the center of the *Montana* cutter is a spring-loaded centering pin (far right cutter in the photo on the opposite page). This pin allows you to chuck the cutter into your hand-held drill and cut a tapered plug. As long as you can keep your drill straight up and down, the cutter works pretty well. I found it easier to do that by clamping the workpiece firmly to a stable surface.



TECHNIQUE

Regardless of the cutter you use, there is a simple process to getting the best results for a virtually invisible plug, as you can see in the box below. And one of the major keys is the proper cutting speed.

Getting a good plug from my drill press requires a slower speed. Setting my drill press to about 500-600 RPM and slowly lowering the cutter into the workpiece resulted in plugs with nice, smooth sides.

Note: When using the *Montana* cutter, running the hand drill at high speed (about 3,000 RPM) produced a good-quality plug. But you'll need to take your time pushing the cutter into the workpiece to get the best results.

As you can see, making your own wood plugs is not difficult. And you'll end up with an almost invisible plug that fits like a cork in a bottle (right photo).

▲ ***Undetectable.*** *The final result is a wood plug that doesn't attract attention.*

6 Easy Steps to Making Plugs

▲ ***Make Plenty.*** *Cutting extra plugs improves your chances of getting the best grain match.*

▲ ***Remove Plugs.*** *Clamp a tall auxiliary fence to the band saw table and cut the plugs free.*

▲ ***Best Match.*** *Select a plug for each hole to match the grain and color of the surrounding wood.*

▲ ***Installing.*** *After brushing glue on the sides of the hole, tap the plug snugly into place.*

▲ ***Remove Waste.*** *Posterboard protects the workpiece while you cut away the waste.*

▲ ***Sand Flush.*** *Finally, sand each of the plugs flush with the surface of the workpiece.*

3

LUMBER RACK

Keep your stock organized and out of the way with this wall-mounted rack.

1

FOLDING ASSEMBLY TABLE

This sturdy table provides plenty of extra worksurface and it folds up for easy storage.

5 easy-to-build Plywood Projects

When it comes to storage space and worksurfaces, it seems like you can never have enough in your workshop. Tools and lumber tend to fill up every available space. So here are five projects specifically designed to address those needs. Whether it's a lumber rack to store your boards, sawhorses to cut them on, or an assembly table where a project comes together, there's something for everybody. And each of these space-savers can be built from a single sheet of plywood, so they won't break the bank. But best of all, each one features a straightforward design that you can build in just a few hours.

5 STORAGE CABINETS
Storage compartments and drawers provide easy access to tools and hardware.

4 ROLL-AROUND CART
Portable storage and large worksurface make this versatile cart a must-have

2 PORTABLE SAWHORSES
Use these sturdy sawhorses alone or with the handy platform.

a folding Assembly Table

▲ ***Folded Up.*** *You won't have a hard time finding a place to store the table when it's not in use.*

When it's time to glue up a project, I usually end up using my workbench as an assembly table. But that means putting all my other work on hold while I wait for the glue to dry. On top of that, any glue squeeze-out from the joints ends up on my benchtop. So when it's all done, I have to spend time cleaning up the bench before getting back to work.

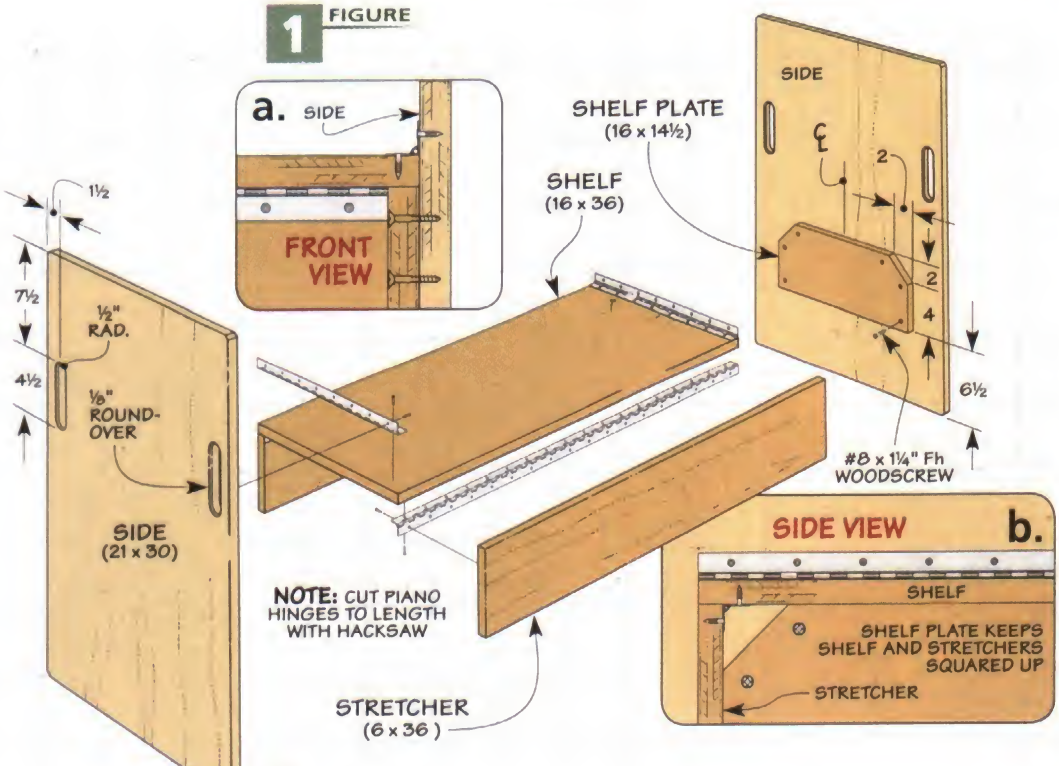
A better place for glue-ups is a dedicated assembly table, like the one in the photo above. This table is strong enough to handle the heaviest assemblies, but folds up for easy storage. The knock-down design means you don't have to give up valuable floor space when it's not in use. And your workbench and other worksurfaces are left free for other tasks.

Construction. As you can see in the drawing at left, the base of this table is simply a shelf attached to two tall sides by a pair of hinges. Connected to the shelf are a pair of hinged stretchers that fold around shelf plates attached to the sides. A removable top fits over the sides to complete the table. And a pair of cleats on the underside of the top fits over the top edge of the sides to tie the assembly together and create a strong, stable platform.

In addition to a sheet of plywood, you'll need three piano hinges and four small window bolt locks to build this project. To find out where to get the hardware, refer to Sources on page 51.

Start with the Sides. After cutting out the parts, as shown in the cutting diagram on the opposite page, you're ready to start assembling the base. I began by cutting out the handles on the sides, using a template and a hand-held router to create the slots. For more on

FIGURE 1



this technique, refer to Shop Short Cuts on page 28. You'll also want to relieve the edges with a round-over bit and sand the edges of the cutout smooth to make it more comfortable to pick up.

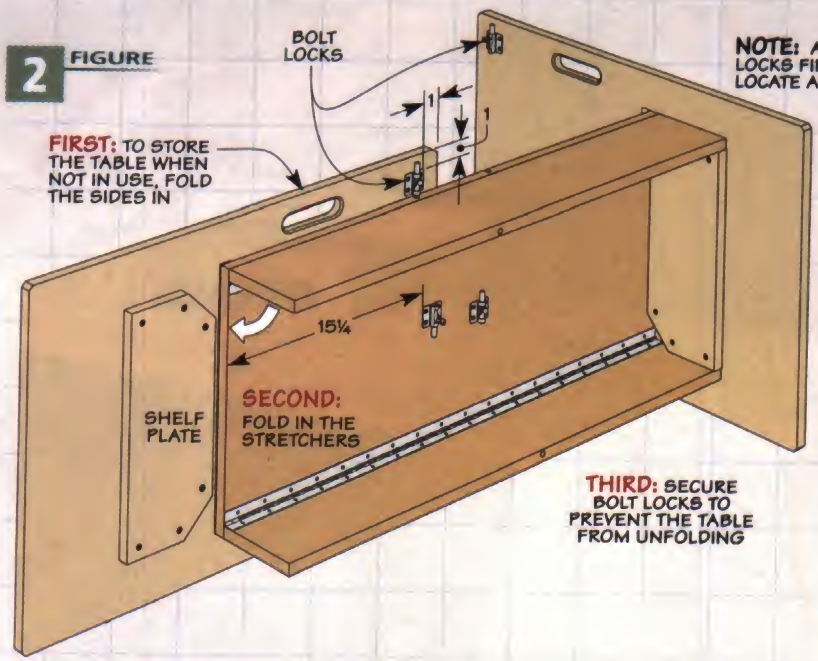
The next step is to add the shelf plates that hold the center section in position when the table is in use. A miter saw makes quick work of cutting the 45° angles on the shoulders of the plates. Now you can fasten the plates to the sides with glue and screws.

Shelf Assembly. With the sides complete, it's time to make the shelf and stretchers. I started by attaching the stretchers to the shelf using piano hinges. The important thing to remember here is to make sure to keep the pieces flush on each end (Figure 2).

Once you've attached both stretchers to the shelf, fit the assembly on the shelf plates and attach it directly to the sides using piano hinges and screws.

Top. As you can see in Figure 3, cleats fit over the base sides and hold the sides in position when assembled. All you need to do is fasten the cleats in position with a little glue and some screws.

2 FIGURE



Add the Bolt Locks. To lock everything into position when folded up, the table is held closed with four bolt locks — two holding each side, and two holding the shelf stretchers in place. And they're pretty easy to install.

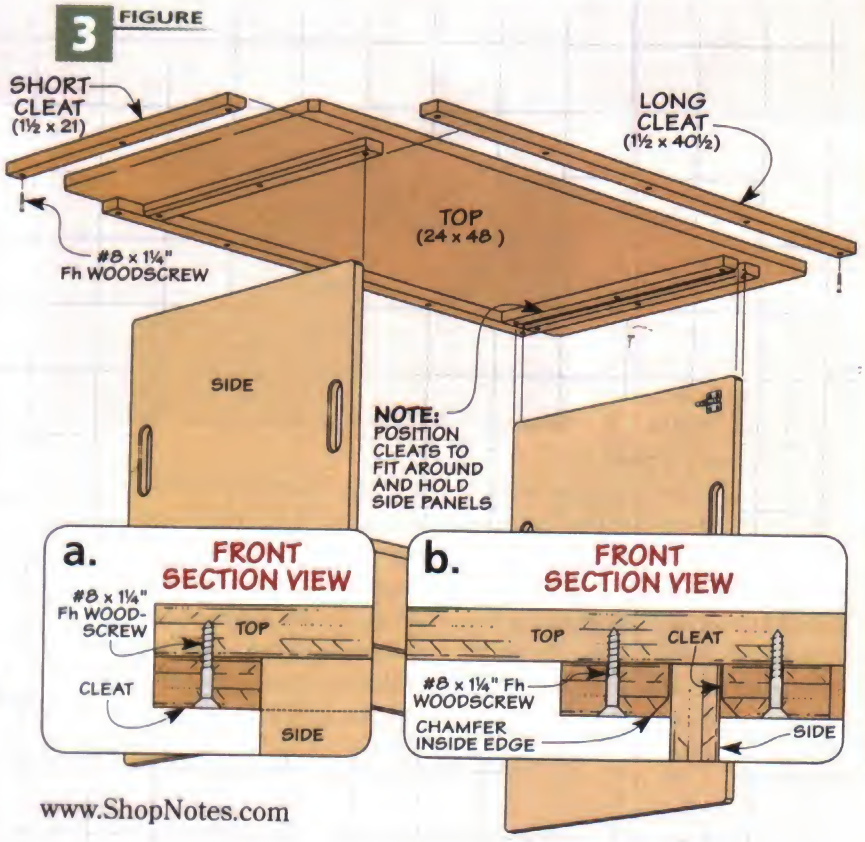
With the table collapsed, you can mark the position for the locks and the matching holes. Drill ⅜"-dia. holes and install the locks with screws, as shown in the photo at right. Now you can give the piece a good sanding and add a couple coats of finish. Since the top may see a lot of glue squeeze-out, I also buffed on a few coats of paste wax to make it easier to clean.

Hardware

- (34) #8 x 1¼" Fh Woodscrews
- (104) #4 x ½" Fh Woodscrews
- (16) #6 x ¾" Fh Woodscrews
- (3) 36" Piano Hinges
- (4) 2" Bolt Locks

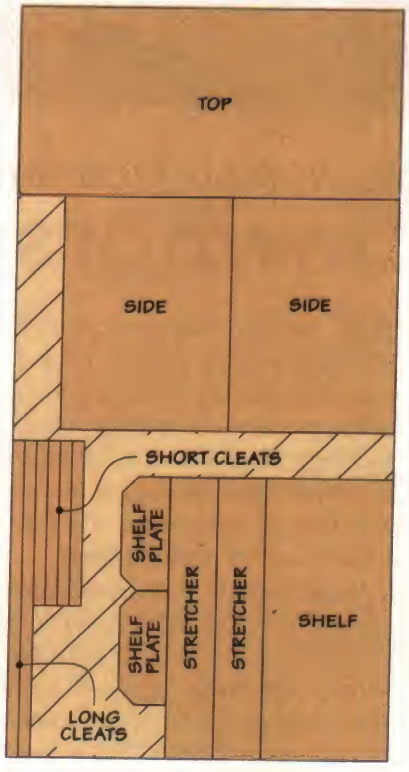
▲ ***Bolt Locks.*** *To hold things in place when folded up, use a simple bolt lock.*

3 FIGURE



CUTTING DIAGRAM

48" x 96" - ¾" PLYWOOD



Mini-Scaffold. *By placing the plank on one of the lower stretchers of the sawhorses, you can use it as a platform when you need to reach the high spots.*

adjustable worksurface and

Sawhorses

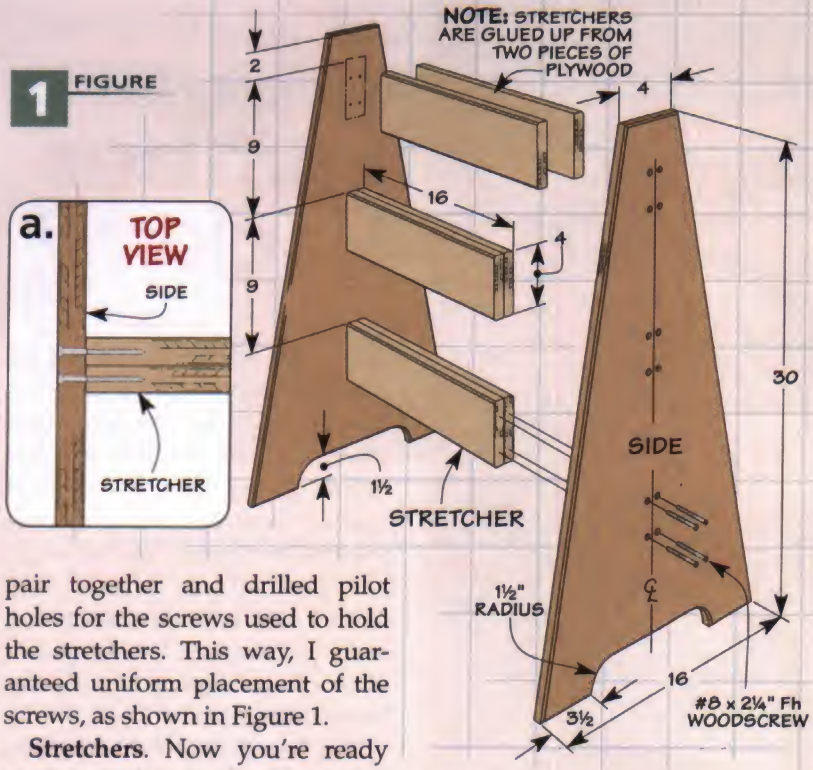
There are plenty of good reasons why every shop should have a pair of sawhorses. They provide a stable platform for cutting boards to length; they'll hold a full sheet of plywood for cutting out pieces; and they're lightweight and portable enough to use anywhere.

In addition to these traditional roles, this design also includes a strong worksurface (cut from the same sheet of plywood), to span the horses. And the extra-sturdy stretchers can be used like a small scaffold to hold the platform in position at different levels.

Tapered Sides. A good sawhorse should have strong, stable legs, or in this case, side pieces to prevent tipping. So I began by laying out and cutting one of the sides. This way, I could use it as a template for the remaining three pieces. To make the tapered cuts, I used a circular saw guided by a straight-edge clamped in place. Then after cutting the round cutout at the bottom, with a jig saw, I just sanded the edges smooth. With one side complete, all you need to do is rough cut the other pieces and use a flush-trim bit in your router to make duplicate side pieces.

After cutting out and cleaning up all the sides, I clamped each

FIGURE 1



pair together and drilled pilot holes for the screws used to hold the stretchers. This way, I guaranteed uniform placement of the screws, as shown in Figure 1.

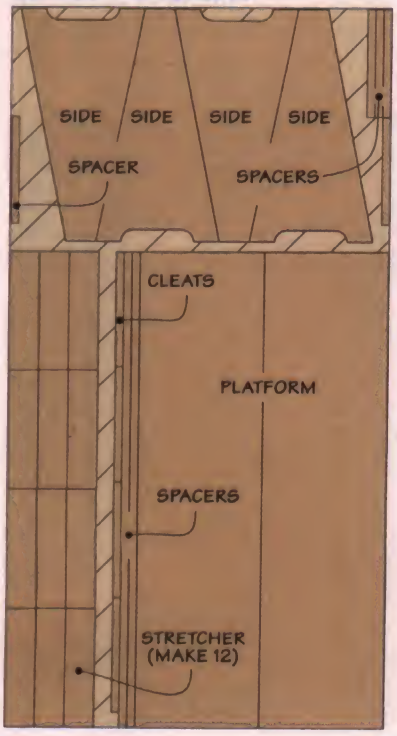
Stretchers. Now you're ready to glue up the stretchers from two layers of plywood. After you've finished that assembly, completing the basic sawhorse is just a matter of attaching the stretchers to the sides with a few screws (Figure 1).

Hardware

- (48) #8 x 1½" Fh Woodscrews
- (69) #8 x 2¼" Fh Woodscrews

CUTTING DIAGRAM

48" x 96" - ¾" PLYWOOD



The Platform. The addition of a work platform that spans the sawhorses makes them even more useful around the shop. And this platform is plenty strong. It's made by sandwiching a series of 1"-wide spacers between two pieces of plywood for extra strength. This arrangement makes the platform rigid enough to hold the heaviest loads without sagging (Figure 2).

Assembling the platform is pretty straightforward. All you need to do is attach the spacers to the underside of the top, and then fasten the bottom to the spacers. This way, you won't have screwheads visible on the top.

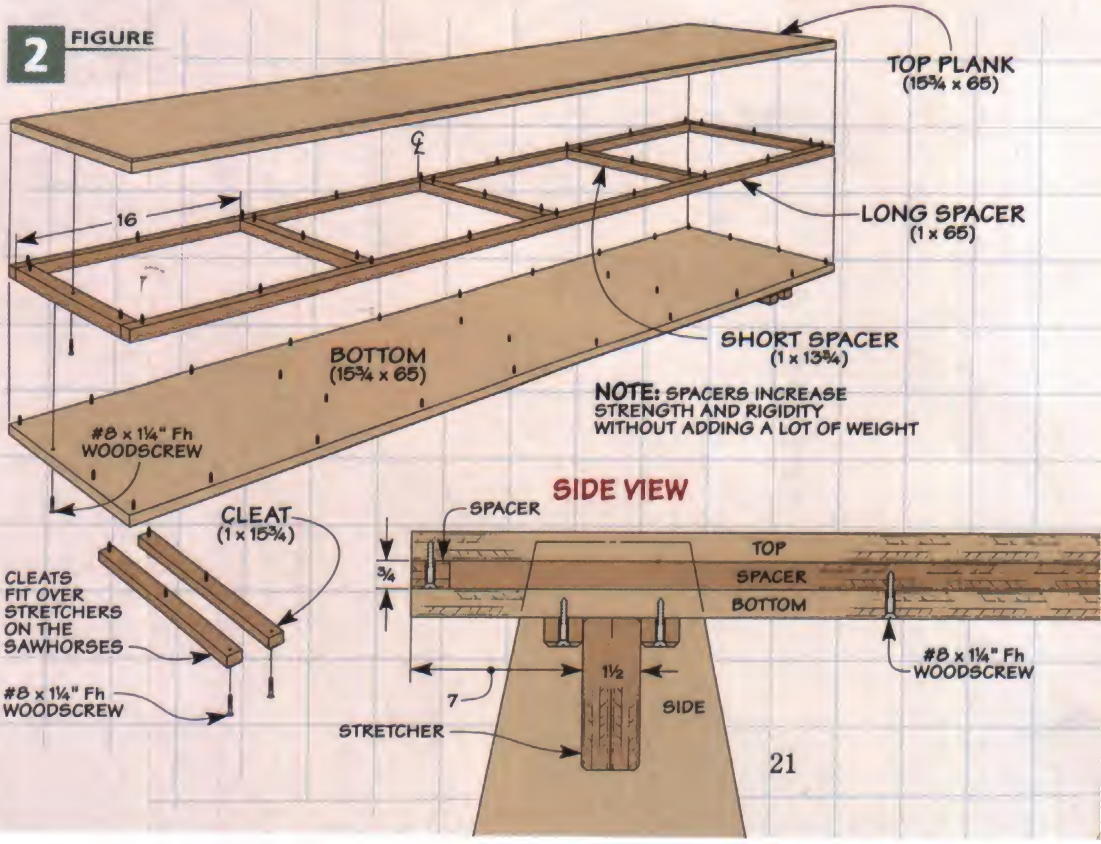
The easiest way to do this is place the top upside down on your workbench. Now lay out the spacers and predrill holes for the screws. Add glue and screws and you're halfway home.

The next step is to mark the location of the spacers on the bottom to make sure you make solid contact with the screws during the final assembly. Finally, glue and screw the bottom in place.

I finished up by adding cleats to the bottom of the platform to hold it securely on the stretchers. Then I chamfered the edges and added a coat of clear finish.

▲ ***Without the Platform.*** *The tall sides provide a handy place for a clamp when cutting a board to length.*

FIGURE 2



wall-mounted Lumber Rack

One of the challenges in any shop is finding a good place to store the lumber for your woodworking projects. It's all too easy to stack boards on the floor or lean them against a wall. But that often leads to moisture damage and bowing.

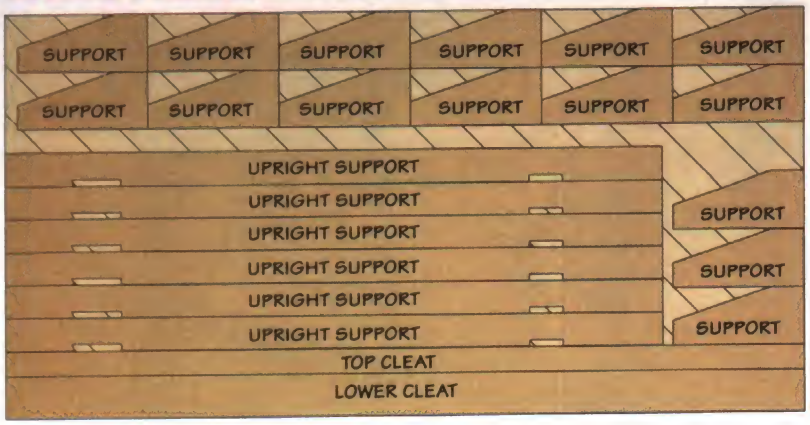
A better solution is to build a lumber rack like the one you see in the photo at left. It holds plenty of wood and, more importantly, keeps it flat and dry.

The rack consists of three vertical assemblies, with five lumber supports on each. These assemblies hang on cleats attached to studs in your shop wall. A short dowel placed in the cleats prevents the vertical assemblies from moving, as shown in the inset photo below.

Start with the Supports. The first step in building the rack is to cut out the lumber supports (Figure 1). Then you can use a shop-built tapering jig to make the angled cut on the bottom of each piece. To find out more about this jig and how to makes these cuts, see the box on the opposite page.

Alignment Pin. *A short length of dowel in the cleats keeps the hanging vertical supports in position.*

CUTTING DIAGRAM 48" x 96" - ¾" PLYWOOD



The Vertical Assemblies. With the supports cut, the next step is to make the uprights. As you can see in Figure 1, the uprights have an angled notch that fits over the top cleat, and a square notch that provides clearance for the lower cleat.

It's important that the notches are positioned identically on all six uprights so the lumber supports hang at the same level. The easiest way to do this is to clamp them together and make layout marks. Then, remove the clamps and cut the pieces one at a time. A jig saw makes short work of these cuts.

Now just attach the lumber supports to the uprights as shown in Figure 1. For this, I used a little glue in addition to the screws.

Hardware

- (120) #8 x 1¼" Fh Woodscrews
- (8) 4" x ¼" Lag Screws
- (8) ¼" Washers
- (15) ⅝" x 3" Dowels

Wall Cleats. As I mentioned earlier, the vertical assembly hangs on wall-mounted cleats. The top cleat requires a beveled cut on the top edge to match the angled notch in the vertical assembly. I made this cut at the table saw.

The next step is to drill holes for the dowels. It's important that they be spaced uniformly on both cleats so the vertical assemblies align. Shop Short Cuts, on page 29, has a tip for drilling these holes.

Mount Up. The last step is to attach the cleats to one of the walls in your shop. Since the rack will be holding a lot of weight, you'll need to make sure the cleats are anchored securely. After identifying the screw locations, all you need to do is predrill holes and attach the cleats with lag screws.

Taper Jig

SHOP TIP

To make the angled cut on the lumber supports, I turned to the table saw and a simple tapering jig. As the drawing below shows, it's just a piece of plywood with a couple of cleats to keep the workpiece in position. The plywood base rides along the rip fence, leaving a consistent cut every time.

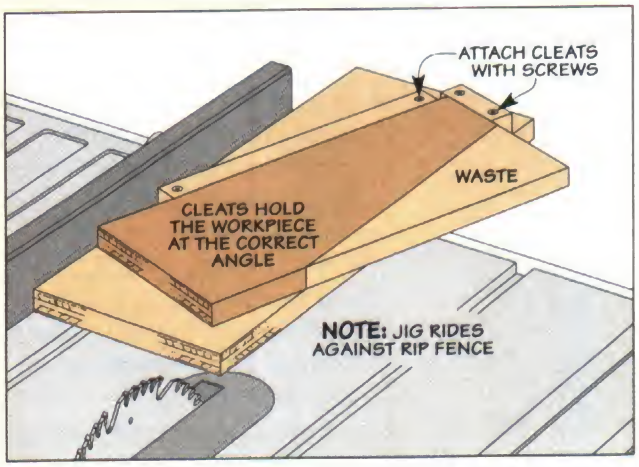
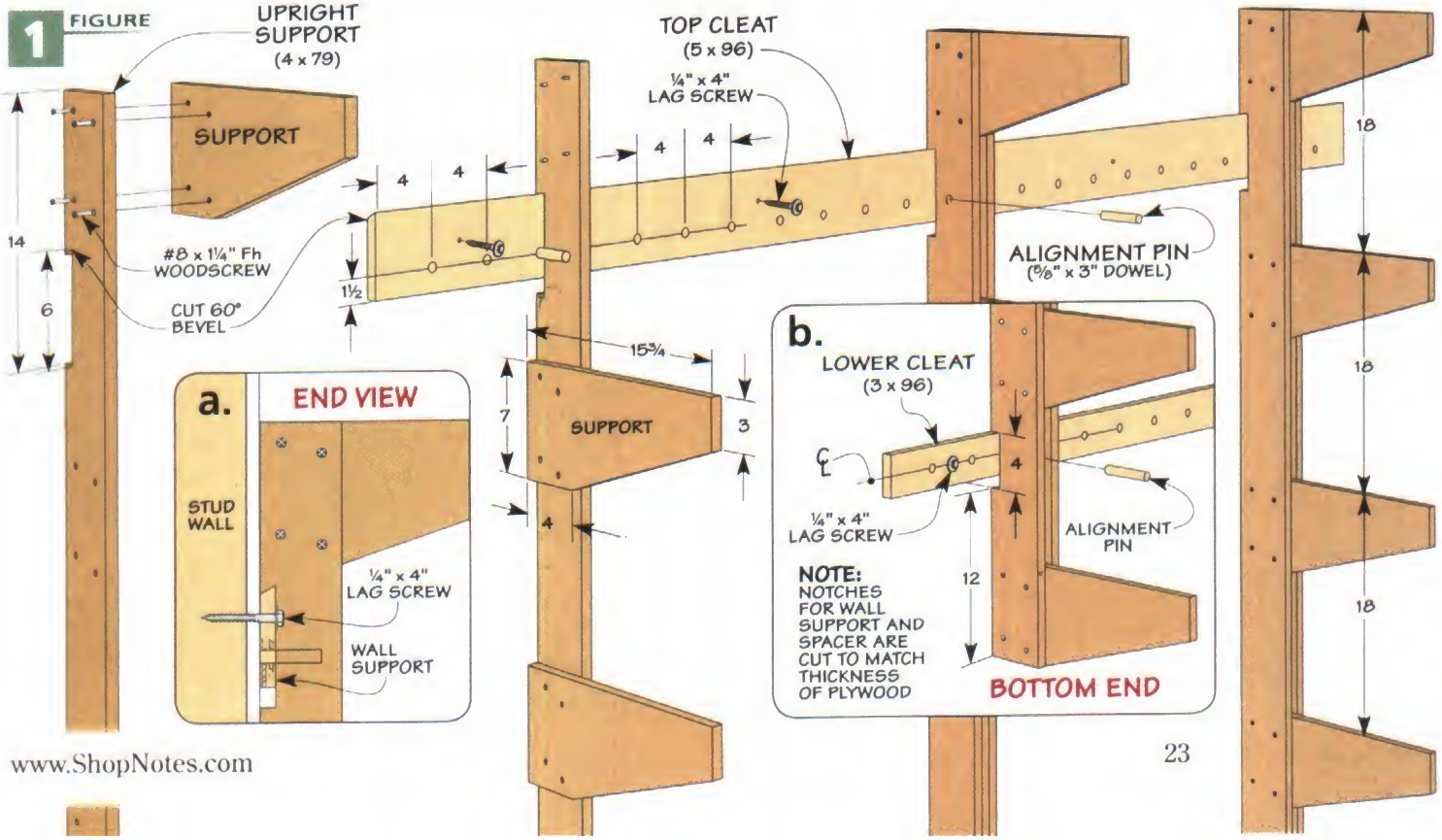


FIGURE 1



roll-around

Utility Cart

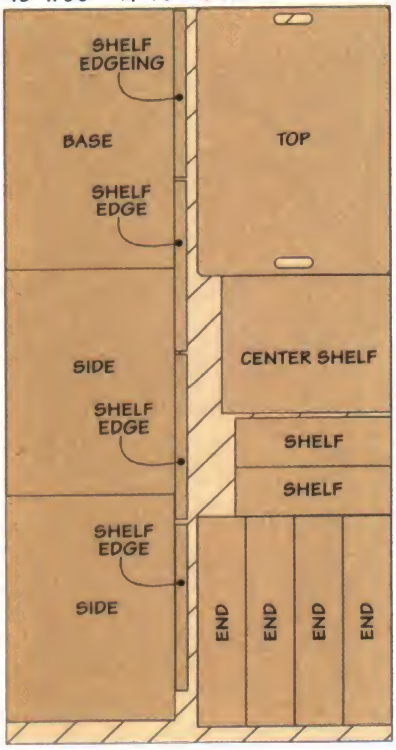
A storage cabinet on wheels is one of the handiest things you can build to make working in your shop easier. It not only gives you a convenient place to store a wide range of items, but also allows you to keep them close at hand wherever you're working. And you'll always appreciate the extra work-surface on top of the cart.

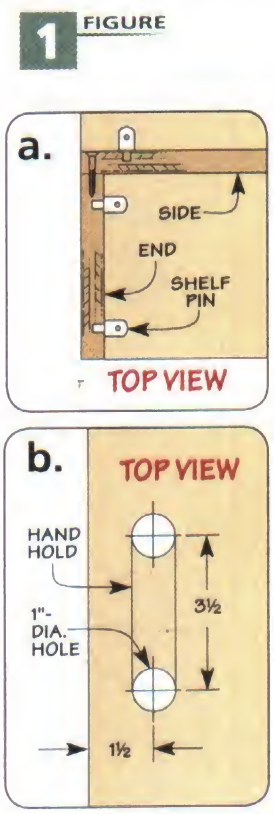
Construction. The construction of the cart is pretty straightforward too. As you can see in Figure 1, it's simply a pair of U-shaped end assemblies attached to the base and top. Each end assembly features an adjustable shelf for convenient storage.

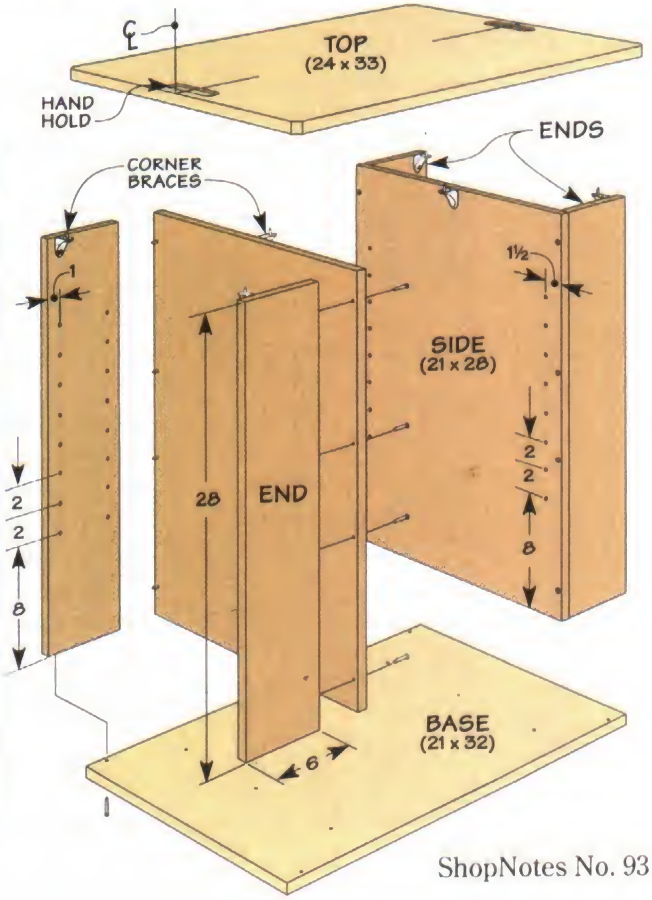
Each assembly is made up of two ends fastened to a side, with shelf pin holes drilled in all three parts. The holes drilled on the inside of the side pieces also allow you to place an adjustable shelf in the center storage compartment. This compartment is a great place for larger items, like power tools and cases.

Start with the Ends. I started by laying out the four ends and clearly marking the bottom edge of each. This way, you'll make sure the shelf pin holes are measured from the same reference edge. I used a simple, shop-built jig for drilling the holes. The box at the bottom of the opposite page has all the details.

You can use the same technique to drill the shelf-pin holes in the inside faces of the two sides. Then, all you need to do is attach the ends to the sides with a little glue and some screws.







The Top. Now that you've completed the end assemblies, you're almost ready to add the top. But first, you'll want to cut out the hand holds. I did this the same way as before, using the jig shown on page 28. Then you can attach the end assemblies to the top using corner brackets and screws.

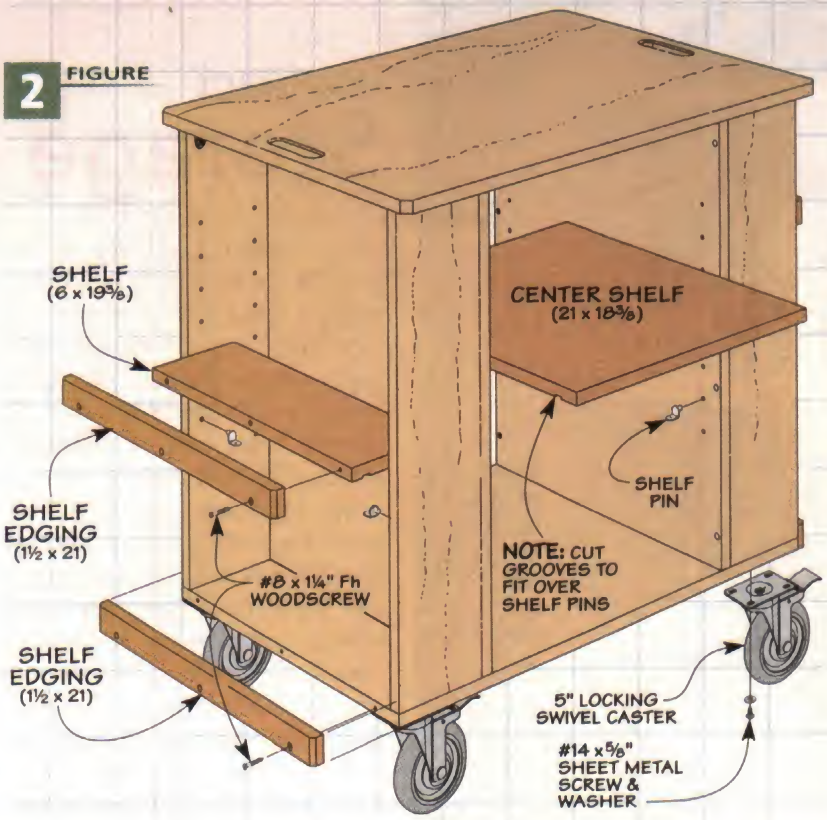
The Base. With the assembly resting on its top, you can add the base. I predrilled holes for screws, making sure to screw into both the sides and the ends.

As you can see in Figure 2, the base also acts as the lower shelf. To prevent things from falling out, it has edging on both ends. These pieces are attached with screws.

Now you can complete the main assembly by adding the casters. I selected 5" locking swivel casters to make sure the cart can handle the heavy loads and will stay put when they're locked.

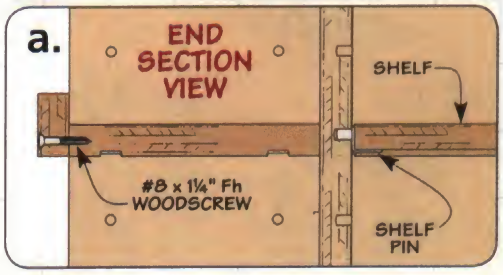
Add the Shelves. Three adjustable shelves (one on each end and one in the center compartment) complete the cart. The center shelf doesn't require any further treatment. But you'll want to add a piece of edging to the end shelves, just like the one on the base.

FIGURE 2



Hardware

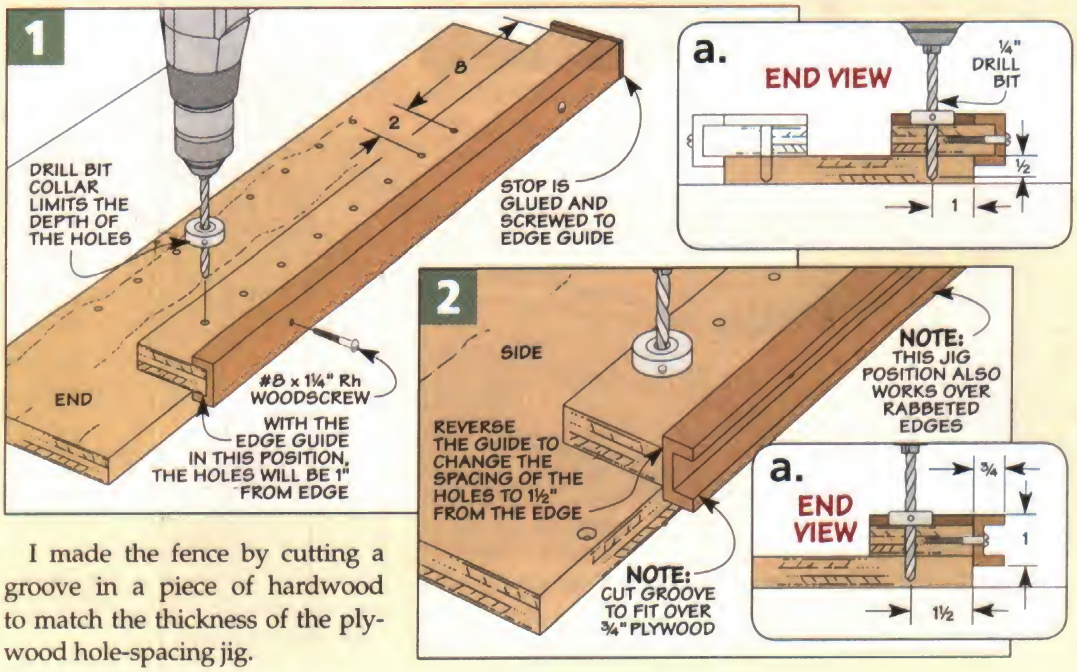
- (38) #8 x 1¼" Fh Woodscrews
- (12) #6 x ¾" Fh Woodscrews
- (16) #14 x ⅝" Sheet Metal Screws
- (4) 5" Locking Swivel Casters
- (12) ¼" Shelf Supports
- (6) ¾" Corner Braces



2-in-1 Shelf-Hole Drilling Jig

When you're faced with the task of drilling evenly spaced holes for shelf pins, the most sensible solution is to make a jig. After all, a jig ensures consistent spacing between the holes. And by registering against a reference edge, it also places the holes a uniform distance from the edge. Since some of the plywood projects in this series require different hole placement, however, I needed a jig that could adjust for those differences.

As you can see in the drawings at right, this jig solves that problem by using an adjustable fence. To change the spacing from the edge, all you need to do is remove a couple of screws, reverse the fence, and replace the screws.



I made the fence by cutting a groove in a piece of hardwood to match the thickness of the plywood hole-spacing jig.

▲ ***Two Stacked Units.*** *If space is really tight, you can stack the storage units. All you need to do is add a couple of alignment pins.*

▲ ***Add a Worksurface.*** *Put a little distance between the units and you can have even more worksurface just by placing a benchtop between them.*

compact Storage Cabinets

The common theme for all the projects so far has been adding storage space and worksurfaces. And the compact storage units shown in the photo at left are no exception. They provide a handy storage space with an adjustable shelf and a small drawer.

The difference is the small footprint. Each unit takes up just over a square foot of floor space, so you can place them just about anywhere. And since you can get two units out of one sheet of plywood, you can stack them up, as shown in the main photo.

I kept construction pretty simple. Dado joinery keeps things aligned properly, then glue and screws secure the joints. And by adding a solid back to the units, you guarantee they'll be plenty strong and won't rack under a heavy load.

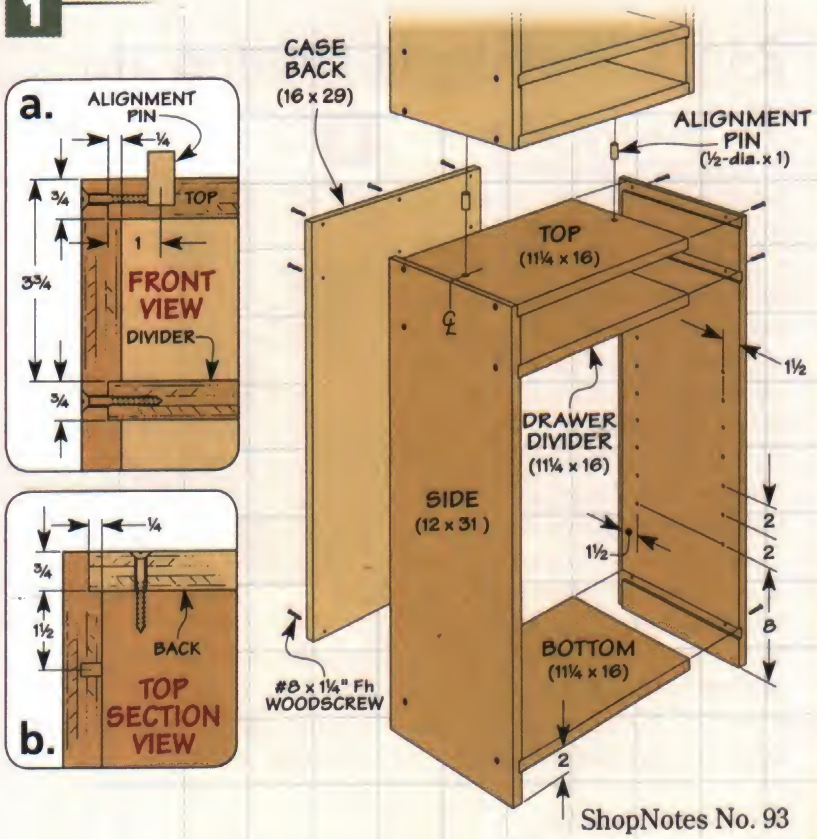
Dado the Sides. After cutting out the pieces, I set up the table saw with a dado blade adjusted to match the thickness of the plywood. Then all you need to do is cut the rabbet for the top and the dadoes for the drawer divider and bottom shelf, as shown in the drawing below.

The next step is to cut the rabbet for the back along the back edge of each side. The important thing to remember here is that you'll need to make two sets of mirror-image sides. So it's a good idea to mark the right and left pieces to avoid confusion as you make the cuts.

Shelf-Pin Holes. The storage compartment has an adjustable shelf, so now is a good time to drill the holes for the pins. To do this, I used the same method and jig described on page 25.

Assembly. With the holes drilled, you're ready to assemble the cabinet. Start by fastening the top, bottom, and drawer divider in position in the dadoes. An easy way to do this is to first glue the joints and clamp up the entire assembly. Then, after drilling countersunk holes, simply drive in the screws.

1 FIGURE



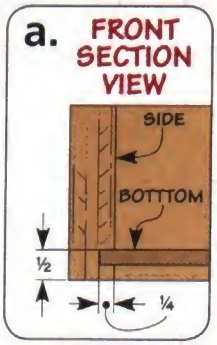
Drawers. A small drawer completes each cabinet. And like the case, it goes together pretty quickly. The drawer sides simply fit into rabbets in the front and back.

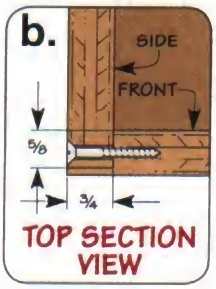
You can begin by heading to the table saw. Use a wide dado blade to cut the rabbets on each end.

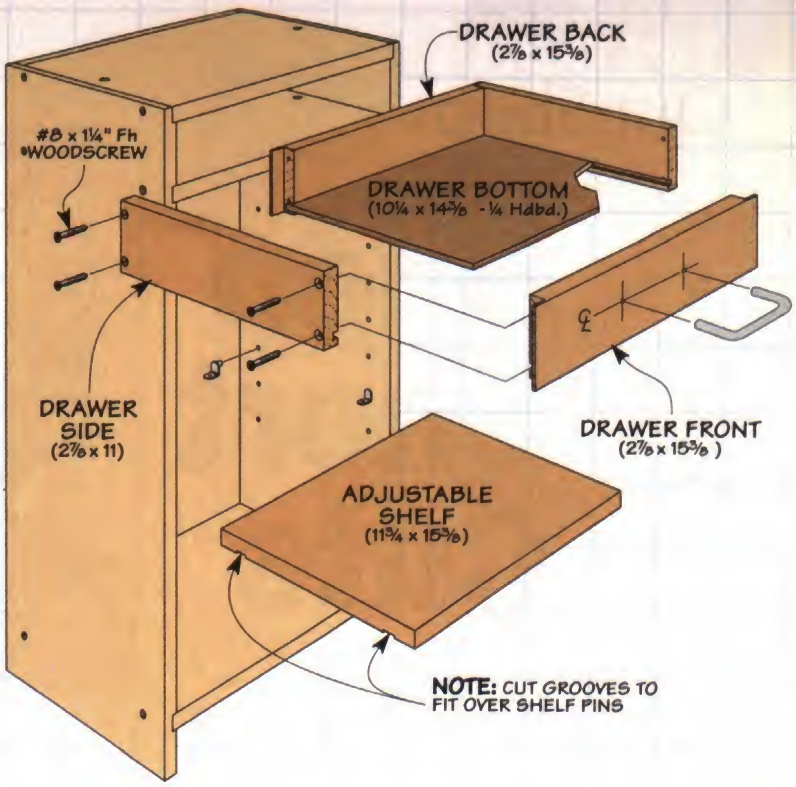
Now, adjust the width of the dado blade to cut the ¼" groove for the drawer bottom in the front, back, and sides. (I used ¼" hardboard for the bottoms.) To complete the assembly, just add glue and screws, as shown in the drawing at right. Then attach a handle or drawer pull. Finally, rub a little wax on the bottom of the sides to keep the drawers moving smoothly.

Alignment Pins. As I pointed out earlier, to save floor space, you may want to stack the units top-to-top. To keep them from shifting out of position, I added a couple of simple alignment pins. They're just short pieces of dowel that fit into matching holes drilled in the case tops, as shown in detail 'a' at left.

FIGURE 2





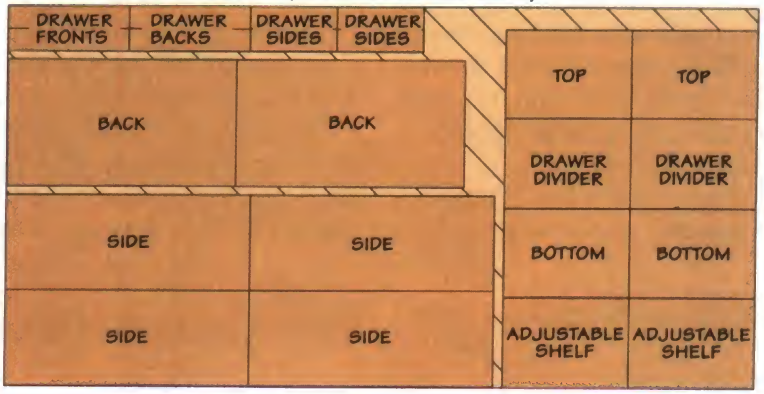


Hardware

- (42) #8 x 1¼" Fh Woodscrews
- (4) #8 x ¾" Fh Woodscrews
- (2) Drawer Pulls
- (2) ½"-dia. x 1" Dowels

CUTTING DIAGRAM

48" x 96" - ¾" PLYWOOD (MAKES 2 STORAGE UNITS)



ALSO NEEDED: ONE 24" x 48" PIECE OF ¼" HARDBOARD

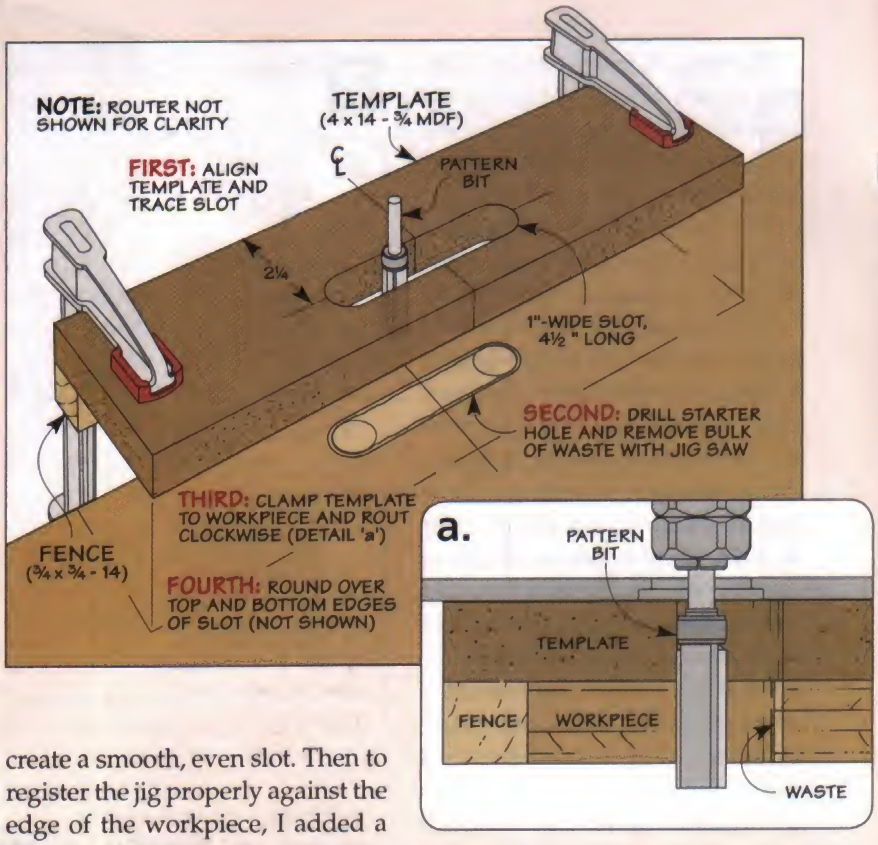
Cutting Plywood with a Circular Saw

All the plans in this series start by cutting out parts according to a cutting diagram. Now you could make many of these cuts at the table saw, but working with a full sheet of ¾" plywood, especially if you're by yourself, can be difficult. But there's an easier way.

I often use my circular saw for this kind of work. It's easier than trying to maneuver the plywood on the table saw, and can be just as accurate if you follow a few simple guidelines.

First, I use a straightedge guide clamped to the plywood. This way, all I have to do is ride the edge of the saw along the guide to get a straight cut. Second, as you can see in the photo at right, I also place the plywood on a sheet of 2"-thick, rigid foam insulation. This supports the full sheet of plywood, and I don't have to worry about cutting into the floor.

Shop Short Cuts

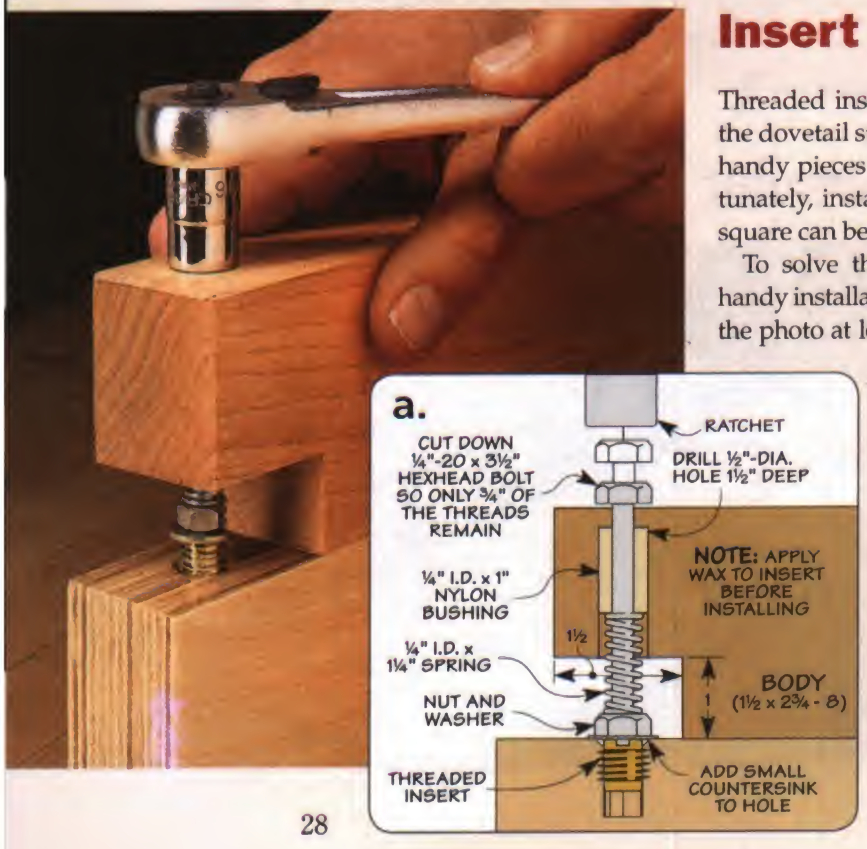


Slot-Cutting Jig

A couple of the plywood projects starting on page 16 require cutting slots for hand holds. Trying to get a smooth, consistent slot with just a jig saw would have been a challenge. Instead, I made the template shown above and then used a pattern bit to create identically shaped slots each time.

The key to the ¾" MDF template is spending the time up front to create a smooth, even slot. Then to register the jig properly against the edge of the workpiece, I added a fence, as shown above.

The first step to creating a slot is tracing out its location with the template. Then, drill a small starter hole and remove most of the waste with your jig saw. Once that's complete, re-align the jig and clamp it securely in place. At this point, you can adjust the depth of cut so the bearing on your pattern bit rides against the inside edge of the template (detail 'a'). After routing the slot smooth (in a clockwise direction), you can round over the edges of the slot.



Insert Installation

Threaded inserts, like the ones in the dovetail station on page 36, are handy pieces of hardware. Unfortunately, installing them perfectly square can be difficult.

To solve this problem, I use a handy installation jig like the one in the photo at left. The jig is nothing more than a block of hardwood with a notch cut at one end. A hole drilled through the notch holds the hardware that keeps the insert straight (drawing at left).

Using the jig is really quite simple. The first thing to do is drill a hole in the workpiece to match the diameter of the body of the insert.

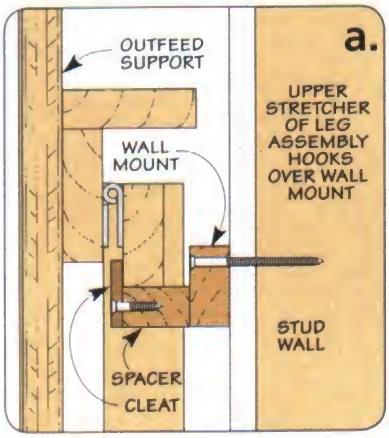
But don't install the insert just yet. If you do, the threads on the insert can "lift" the edges of the hole slightly, especially on a workpiece with thin veneer (like plywood) or plastic laminate. To prevent this, I like to drill a small countersink around the edge of the hole.

Next, slip a washer onto the bolt and thread the insert on. Then set the jig (and insert) in place over the hole. To seat the insert in the hole, simply press the jig down against the workpiece. Now it's just a matter of turning the head of the bolt with a ratchet until the threads start cutting into the wood. Continue turning until the insert is flush with the surface.

Outfeed Support Wall Mount

The fold-up design of the outfeed support on page 30 makes it easy to store just about anywhere. But if you want to store the support off the floor, check out the handy wall mount shown in the main drawing and detail below.

The mount is just a couple ¾"-thick hardwood strips glued and screwed together to fit under the upper stretcher and between the legs of the support. A hardboard cleat attached to the front edge keeps the support in place (detail 'a'), but still allows easy removal.

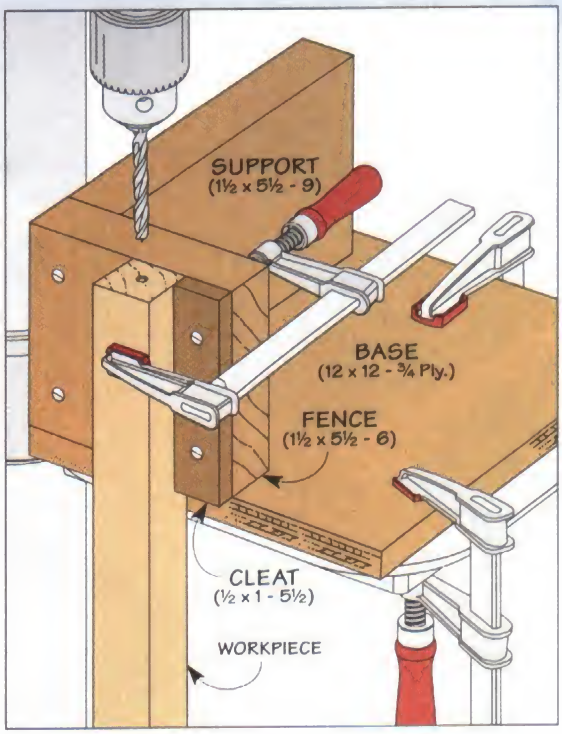


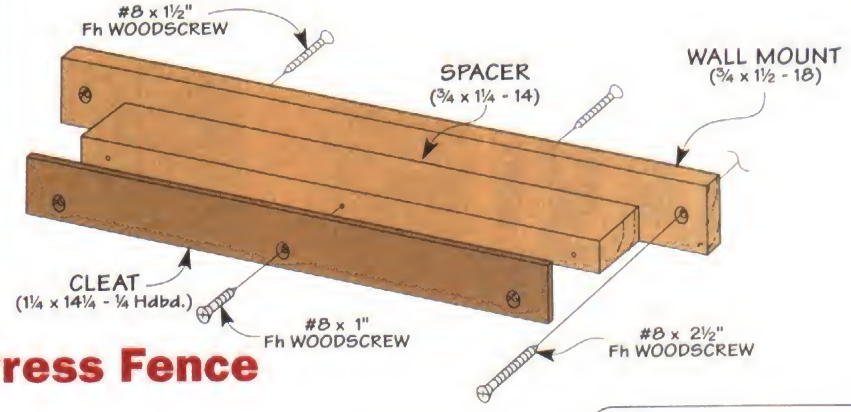
Vertical Drilling Jig

Drilling a perfectly aligned hole in the end of a long workpiece, like the legs of the outfeed support on page 30, is a tough task. Fortunately, the jig shown at right makes the task easy and accurate.

The jig is just a fence with a support screwed to the back to keep it square. A cleat attached to the fence registers the workpiece. And a plywood base allows you to securely clamp the jig to the drill press table.

To use the jig, first loosen your table and swing it to the side. After clamping the workpiece in place, simply adjust the position of the jig to align the bit. Then after tightening up the table and clamps, you can drill the hole.





Extra-Long Drill Press Fence

The small size of some drill press tables can make it almost impossible to drill long workpieces, like the cleats of the lumber rack on page 22. There's just not enough support for the workpiece, especially if you drill near the ends. To make the job easier, I used aluminum angle to make an extra-long fence and then added some plywood supports (drawing at right).

To act as outriggers, the supports are screwed to the bottom of the fence near the ends. They provide the extra "hand" needed for a long workpiece. Once the supports are added, simply align the fence to accurately position the workpiece under the bit. Then you can clamp the fence to your drill press table and get to work.

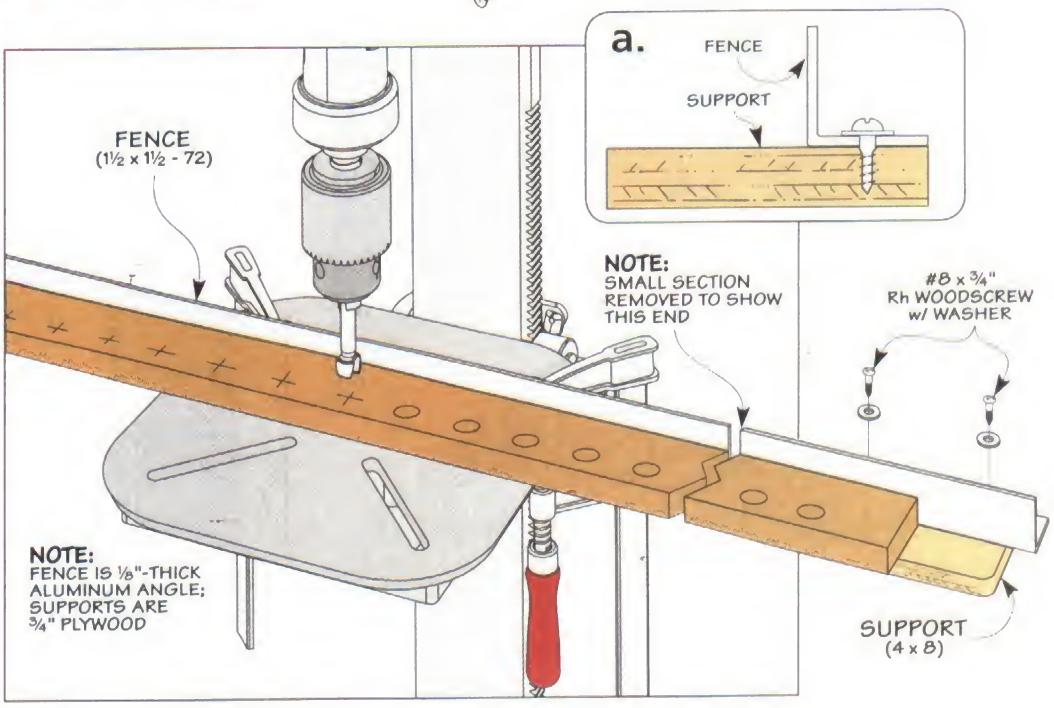


table saw Outfeed Support

This easy-to-build addition to your table saw takes the hassle out of cutting long boards and sheet goods.

Adding an outfeed support to your table saw is like gaining an extra pair of hands in the shop. It provides sturdy support whether you're ripping a long board or cutting plywood down to size.

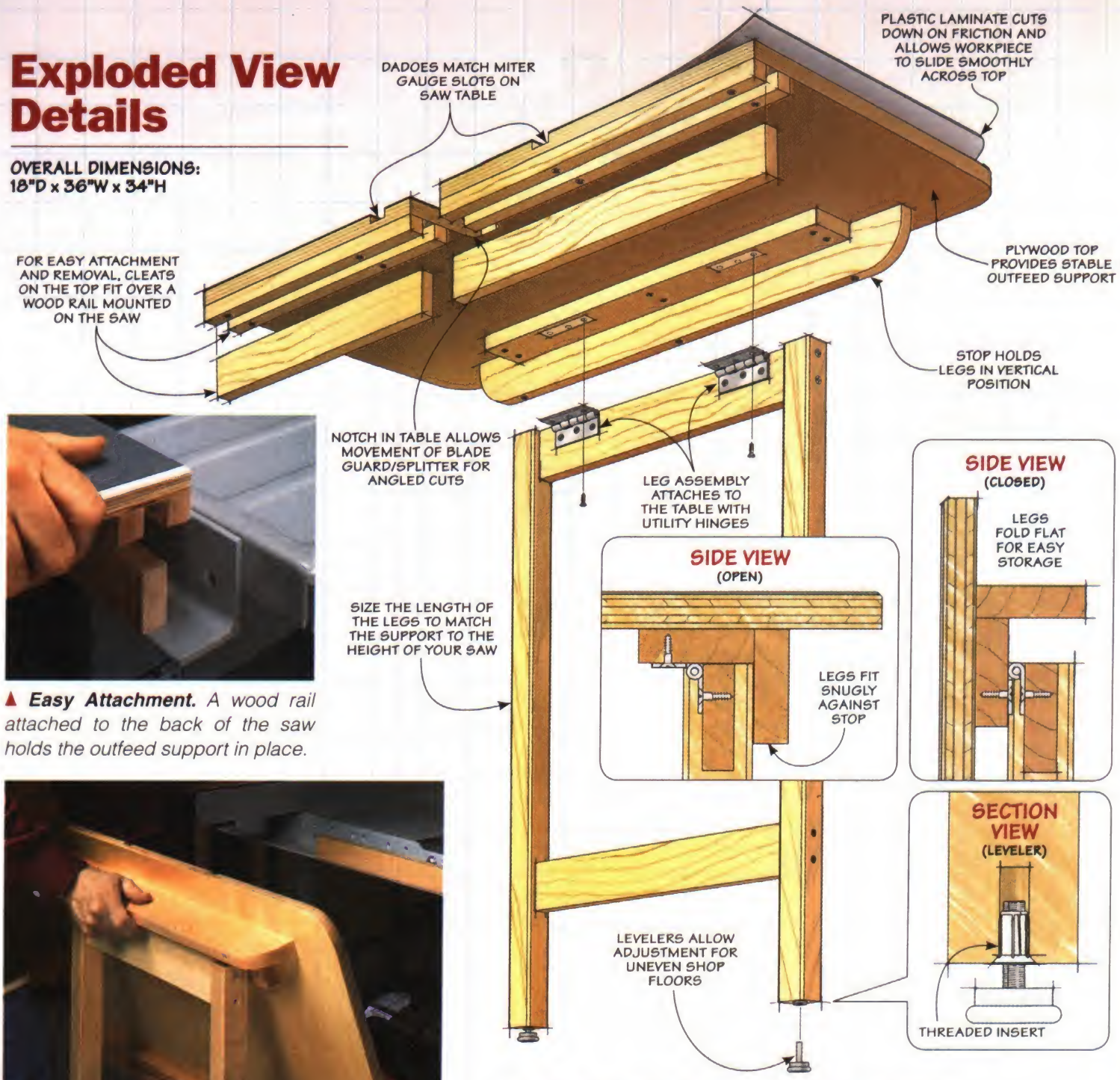
The outfeed support shown in the photo provides this plus a few key features. For instance, slots in the top allow you to use your miter gauge without removing it.

A leveler at the end of each leg lets you make fine height adjustments. This means you can align the top to your saw table to compensate for any unevenness in the floor of your shop.

To connect the outfeed support to your table saw, cleats hook over a wood rail on the back rail of the saw. (I've included mounting options for the two most common types of fence arrangements.) And since the legs fold up, the support table can be quickly removed and hung on the wall for storage.

Exploded View Details

OVERALL DIMENSIONS:
18"D x 36"W x 34"H



▲ ***Easy Attachment.*** *A wood rail attached to the back of the saw holds the outfeed support in place.*

Fold Up and Store. *When not in use, the table folds up for easy storage.*

Materials & Hardware

A	Top (1)	18 x 36 - ¾ Ply.
B	Hinge Plate (1)	¾ x 2½ - 22
C	Leg Stop (1)	¾ x 2½ - 28
D	Front Cleats (4)	¾ x ¾ - 17
E	Legs (2)	1½ x 1½ - 36 (Rough)
F	Stretchers (2)	¾ x 2½ - 16½
G	Saw Rail (2)	¾ x 2 - 18

- (1) 18" x 36" Plastic Laminate
- (2) 3" Utility Hinges with Screws
- (2) Leveling Feet
- (2) 5/16" Threaded Inserts
- (11) #8 x 3" Fh Woodscrews
- (14) #8 x 1¼" Fh Woodscrews

building the

Support

An outfeed support should be stable enough and large enough to catch a workpiece as it slides off the saw. And this design fills the bill on both counts. The folding leg assembly and solid connection to the saw provide a strong base. And with the 18" by 36" top, you'll have plenty of worksurface.

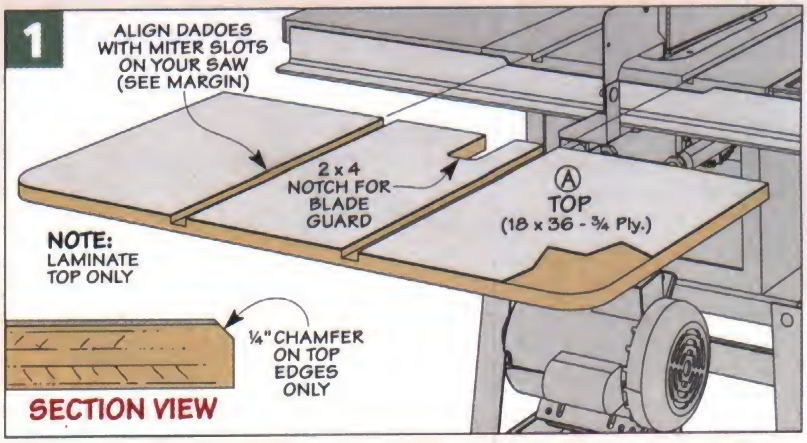
Table Top. I used ¾" plywood for the top because it's flat, inexpensive, and resists warping. And by adding laminate, you get the extra benefit of a low-friction surface.

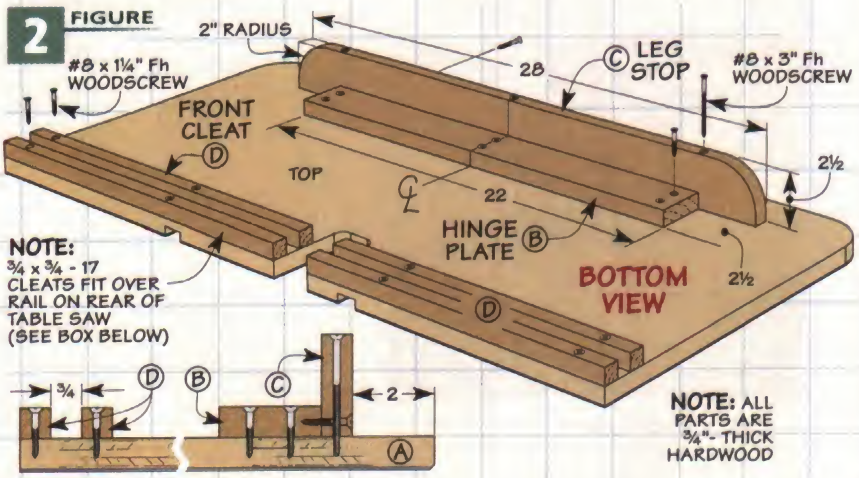
You can start by cutting the top to size and rounding off the back corners. I also cut a notch on the front edge of the table for the blade guard (see the box below).

Next, I glued on an oversized piece of laminate and trimmed the edges with a router and a flush trim bit. The laminate creates a durable surface for the table.

Top Dadoes. To complete the table top, you'll need to cut a couple of dadoes. Align these slightly oversize dadoes to match the miter slots on your table saw so the miter gauge has clearance as you make a cut (photo at left).

▲ ***Miter Bar Slot.*** *A dado slightly wider than the miter slot provides clearance for the miter gauge bar.*





Leg Stop. Now you can turn the top over and add a couple of hardwood support pieces that will hold the legs. I started by attaching a leg stop to help stabilize the legs and keep them properly positioned while the table is being used. This stop is just a piece of ¾"-thick hardwood that's screwed to the top.

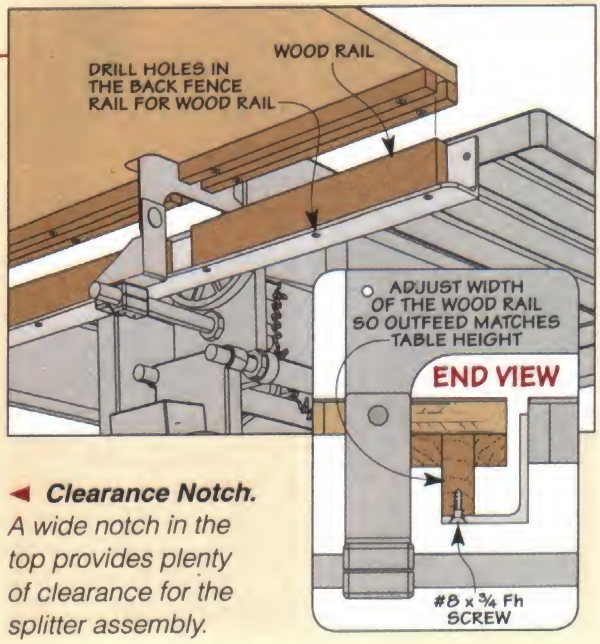
Hinge Plate. The next step is to add a mounting plate for the legs. Simply center the hinge plate along the inside edge of the leg stop and attach it with screws (Figure 2).

Notch & Attachment

There are a couple things that can make adding an outfeed support a little tricky. First, you'll need to provide clearance for the blade guard/splitter assembly. As you can see in the photo, I cut a 2"-wide slot 4" deep to accommodate the splitter angled to 45°.

The second challenge is mounting the support to your saw. On many saws, there's a steel fence rail running along the back edge. In this case, it's just a matter of drilling a few holes in the rail and attaching a wood rail with screws.

The drawings at right show how the cleats on the outfeed support fit over the rail to hold the support in place. You can simply adjust the width of the rail until the top is level. If your saw has tube-style fence rails, see the next page for an alternate mounting method.



◀ ***Clearance Notch.*** *A wide notch in the top provides plenty of clearance for the splitter assembly.*

LEG ASSEMBLY

A simple leg assembly holds the back of the outfeed support. The legs are connected by a pair of stretchers. And the top stretcher attaches the legs to the hinge plate.

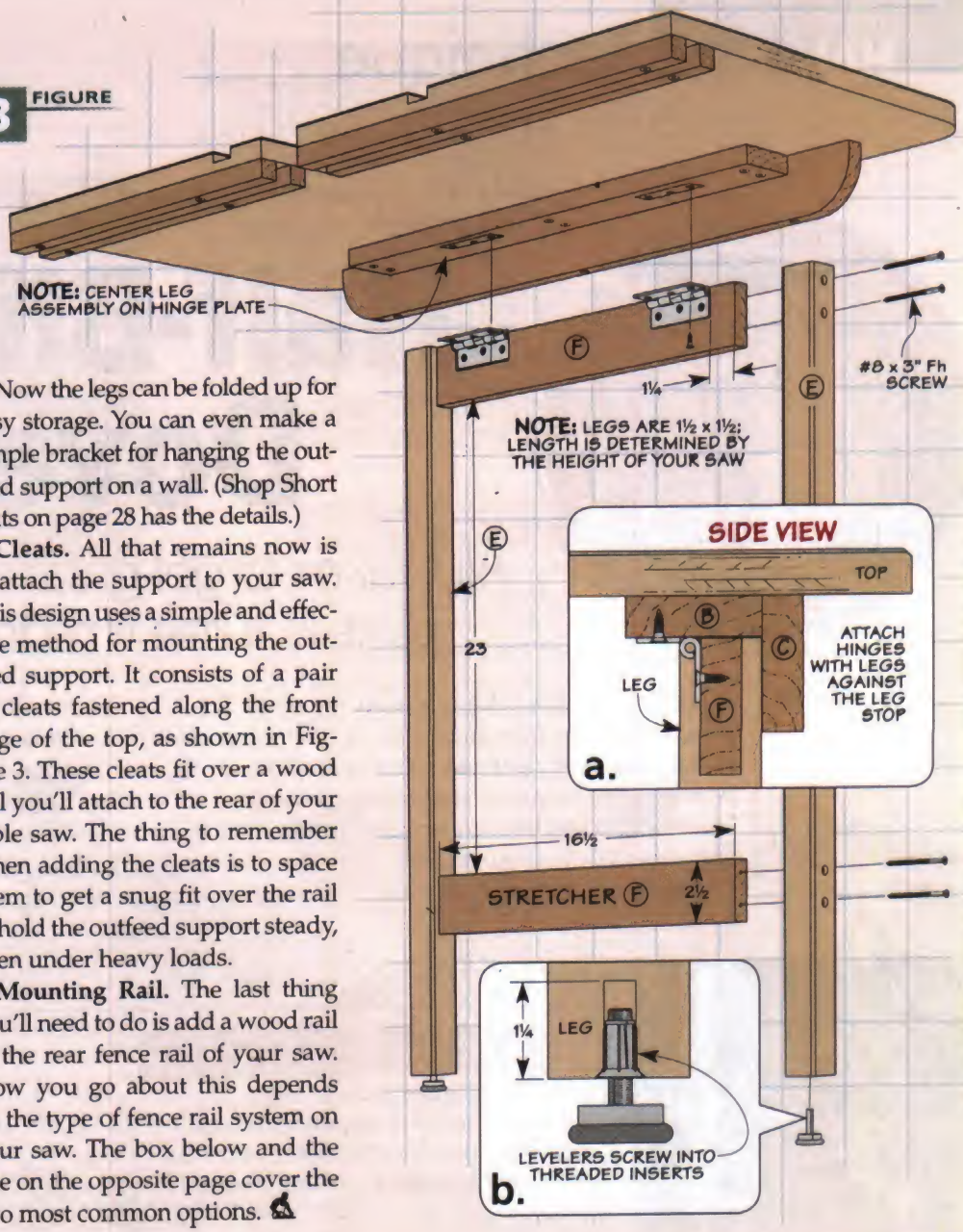
Legs. The legs are cut from 1½"-thick stock. You'll need to size the length of the legs to fit your saw. To do this, just measure from the floor to the top of your saw. Then subtract 2½" to determine the length of the legs. (The 2½" accounts for the thickness of the top, the hinge plate, and the leg levelers.)

After cutting each leg to length, I drilled a hole for the threaded insert that holds the leveler in the bottom of the leg. In Shop Short Cuts on page 28, you'll see an easy way to do this. Now, you can soften the edges at the router table with a ⅛" roundover bit.

Stretchers. To add strength to the assembly and prevent racking, I connected the legs with a pair of stretchers. After cutting the stretchers to size, you can attach them with long screws, as shown in Figure 3.

The next step is to fasten the legs to the top. To do this, first, screw the hinges to the top stretcher, then to the hinge plate on the table like you see in detail 'a.'

FIGURE 3



Now the legs can be folded up for easy storage. You can even make a simple bracket for hanging the outfeed support on a wall. (Shop Short Cuts on page 28 has the details.)

Cleats. All that remains now is to attach the support to your saw. This design uses a simple and effective method for mounting the outfeed support. It consists of a pair of cleats fastened along the front edge of the top, as shown in Figure 3. These cleats fit over a wood rail you'll attach to the rear of your table saw. The thing to remember when adding the cleats is to space them to get a snug fit over the rail to hold the outfeed support steady, even under heavy loads.

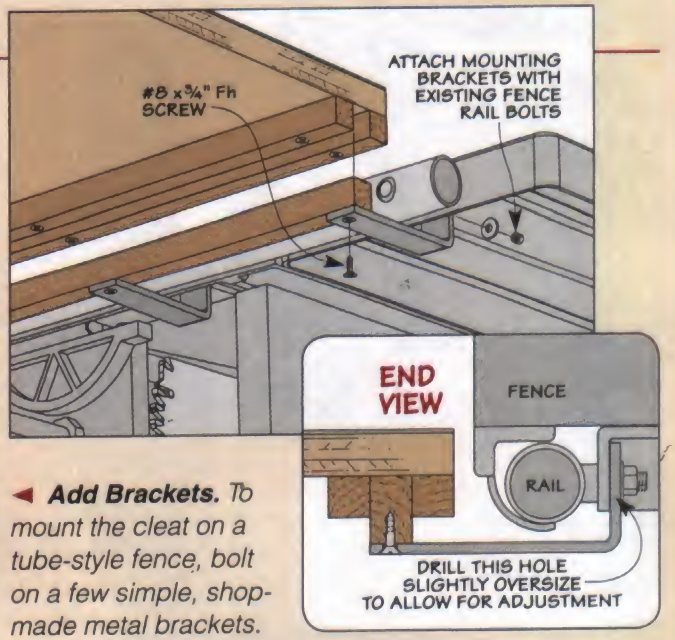
Mounting Rail. The last thing you'll need to do is add a wood rail to the rear fence rail of your saw. How you go about this depends on the type of fence rail system on your saw. The box below and the one on the opposite page cover the two most common options.

Tube-Style Attachment

Attaching the outfeed support to a saw with tube-style rails presents a real challenge. You can't fasten anything to the tube without interfering with the movement of the fence. So, the first step is to add metal brackets to the saw. They'll hold the wood rail that attaches to the outfeed support. You should add a bracket to each bolt that holds the tube to the saw.

To make the metal brackets, I used 1"-wide strips of 3/16"-thick steel. I started by cutting the strips to length (about 6½") and drilling holes for the mounting bolts. Then, I made the 90° bend in the steel by securing the piece upright in a vise and pounding it over flat.

Now it's just a matter of drilling holes and attaching the wood rails using screws, as shown in the drawings at right.



◀ ***Add Brackets.*** *To mount the cleat on a tube-style fence, bolt on a few simple, shop-made metal brackets.*

tips and tricks for perfect Half-Blind Dovetails

All it takes to get great-looking, tight-fitting joints is a little time for proper setup.

A dovetail jig gets a lot of use in my shop. But it always seems to take quite a bit of time to get my router bit set just right and all the settings on my jig perfect before I can even start routing dovetails.

I decided it was time to take note of some of the tips and tricks I've learned over the years about routing half-blind dovetails and put them all in one place.

On these two pages, you'll learn how to adjust your router and dovetail jig to make clean, accurate cuts every time. Like how a sharp bit and proper router setup can save you some trouble later on. And how to get the most out of your jig. There are some other handy tips that'll help you out, too. They're little things, but they add up to great results.

Start off Right

CENTER THE BIT

You can't guarantee that the bit is exactly centered in the bushing, so use a centering cone to help position the bushing and baseplate (refer to Sources on page 51). Plus, it's a good idea to hold the router in the same orientation all the time to help ensure a good-fitting joint.

HAVE EXTRA STOCK ON HAND

It might take some trial and error to get the exact setup for a perfect joint. Have plenty of extra stock on hand for test cuts. And be sure to use stock milled to the same thickness that you'll be using to construct your drawers.

PROPER BIT DEPTH

When adjusting bit depth, remember "heighten to tighten, lower to loosen." In other words, if your dovetail joint is too loose, you should increase the bit depth. On the other hand, for a joint that's too tight, lower the bit depth.

ELIMINATE "BIT SLIP"

Double-check to make sure the bit is tight in the collet. You don't want the bit to "climb" out of the collet during use.

USE A SHARP BIT

Invest in a good carbide bit for better cuts and longer life. Then clean and hone your bit occasionally to eliminate burning.

Fine-Tune Your Results

MAKE CLAMPING BLOCKS

An L-shaped clamping block the same thickness as your workpiece keeps the clamping bar from "racking" so they'll apply consistent pressure across the workpiece. Then, once you have a perfect cut, rout a dovetail in the block to use as a depth gauge for your next project.

SECURE THE WORKPIECE

Some jigs have a rough surface on the clamping bars to securely hold the workpiece. If yours doesn't, add some self-adhesive sandpaper to the clamping bars of your jig for extra holding power.

REDUCE CHIPOUT

Chipout sometimes occurs on drawer sides. One trick that can eliminate chipout is making a light scoring cut along the front of the drawer side before cutting the dovetails. You can also start with wider workpieces and then trim them to size, removing any tearout that may occur at the edges.

ELEVATE THE JIG

A platform, like the workcenter on page 36, gives you extra height to make routing dovetails more comfortable. You can better see what you're doing while routing at eye level.

START WITH FLAT, SQUARE WORKPIECES

Cup or twist in a workpiece will cause trouble getting a proper fit. Plus, make sure the ends of the workpieces are square, otherwise you'll get a poor fit and your drawer may be twisted.

MAKE SLIGHT ADJUSTMENTS

Don't try to adjust too many things at once. Taking it one small step at a time is the best way to hone in on a flush joint and snug fit.

portable dovetail jig Workcenter

Accuracy, convenience, and storage. You get it all with this simple workcenter for your dovetail jig.

The dovetail jig gets a lot of use in my shop. But there are a few things that can be an inconvenience when using it. My biggest complaint is that I have to stoop over to see what I'm doing as I work. Another problem is keeping the workpieces clamped square. And finally, when I'm done for the day, I have to find a place to store the jig and accessories.

The handy workcenter you see in the photo solves all these problems. For starters, it makes a great platform for any dovetail jig. By raising everything to a comfortable height, it's easier to guide the router. Support bars help keep the workpieces square and position them properly for accurate results.

Plus, there are some other great features. There are "wings" that fold down. They make a handy landing spot to dock your router during use without damaging the bit or your benchtop. And there's plenty of storage in the large drawer down below.

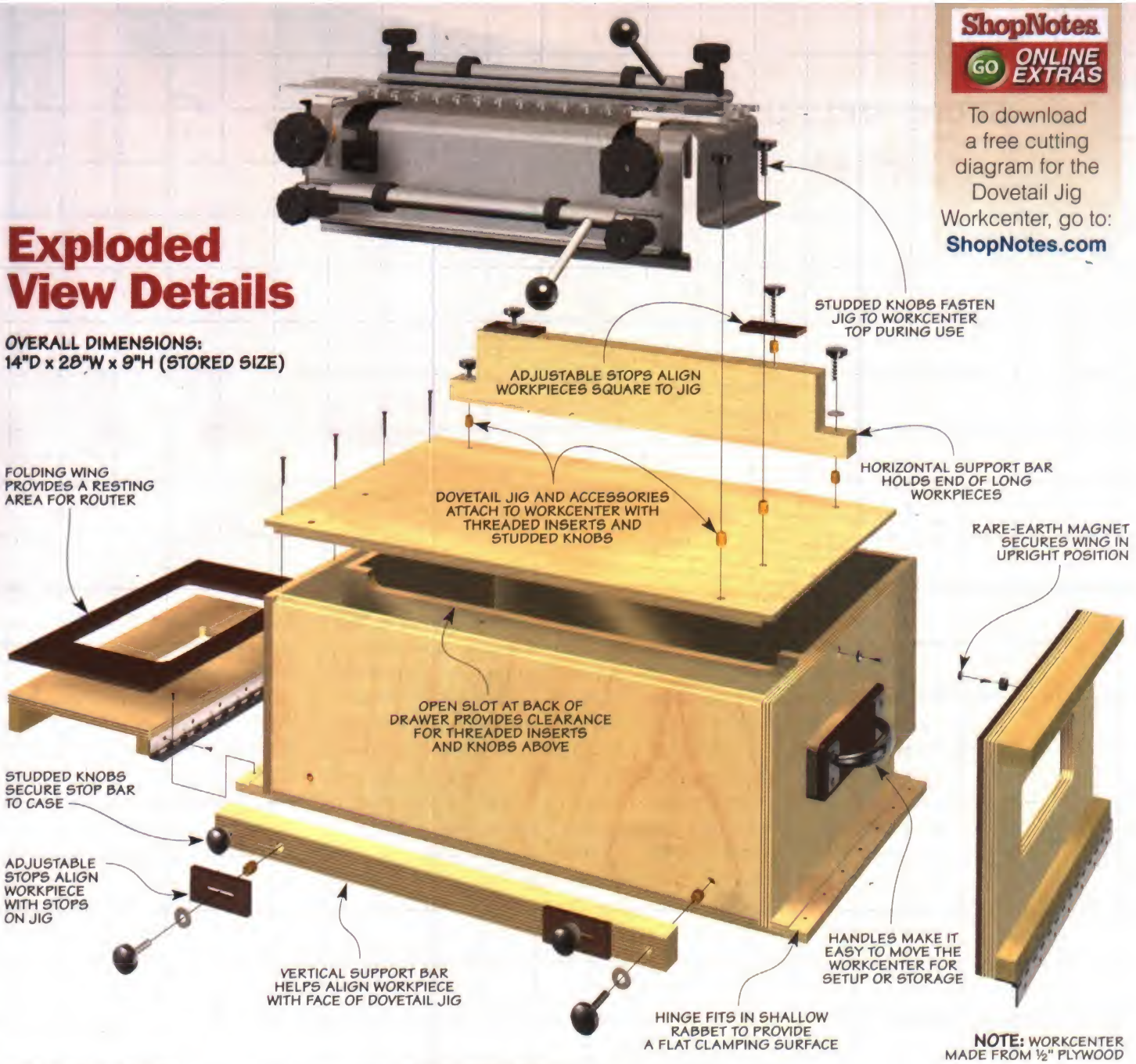
Once you build this workcenter, you'll find that using your dovetail jig is a whole lot easier.

ShopNotes
GO ONLINE EXTRAS

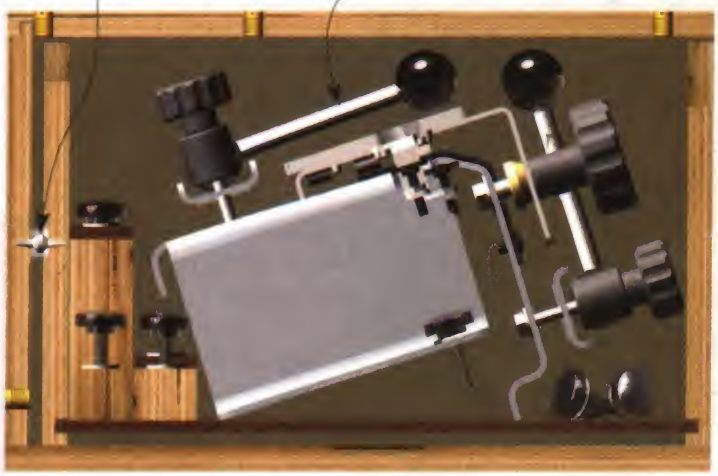
To download a free cutting diagram for the Dovetail Jig Workcenter, go to: ShopNotes.com

Exploded View Details

OVERALL DIMENSIONS:
14"D x 28"W x 9"H (STORED SIZE)



NOTE: WORKCENTER MADE FROM ½" PLYWOOD



SIDE SECTION VIEW
(DRAWER STORAGE DETAIL)

▲ ***Tucked Away.*** *The large drawer is sized to hold the jig, templates, support bars, and knobs. And with the wings folded up, the workcenter stores neatly away.*

strong and sturdy

Case

In the drawings below, you'll see that the workstation starts out as a simple box. As a matter of fact, it's a lot like a cabinet with a top, bottom, and two sides. But unlike a normal cabinet, the front is a solid panel. And the back is open for the large storage drawer.

For now, you'll concentrate on building the basic box, starting with the sides then adding the top and bottom pieces. Later you'll add the folding wings, handle, and storage drawer.

There's one thing you need to know before you get started. My workcenter was sized for the *Porter-Cable* 4212 dovetail jig. If you have a different jig, you may need to make some adjustments to the size of the case, the height of the support bars, and the drawer.

Sides. I started on the case by cutting the sides to size. Then you just need to cut grooves for the front panel before moving on to the top and bottom pieces.

Top and Bottom. If you take a close look at Figure 1a, you can see how the sides of the case fit into dadoes on the bottom piece and rabbets on the top.

It can be tricky to get these joints to line up so the case ends up square. To get around this problem, I cut the top and bottom pieces to the same size then cut matching dadoes in both. Then all you need to do is trim the waste off the ends of the top piece to form rabbets as shown in Figure 1 below.

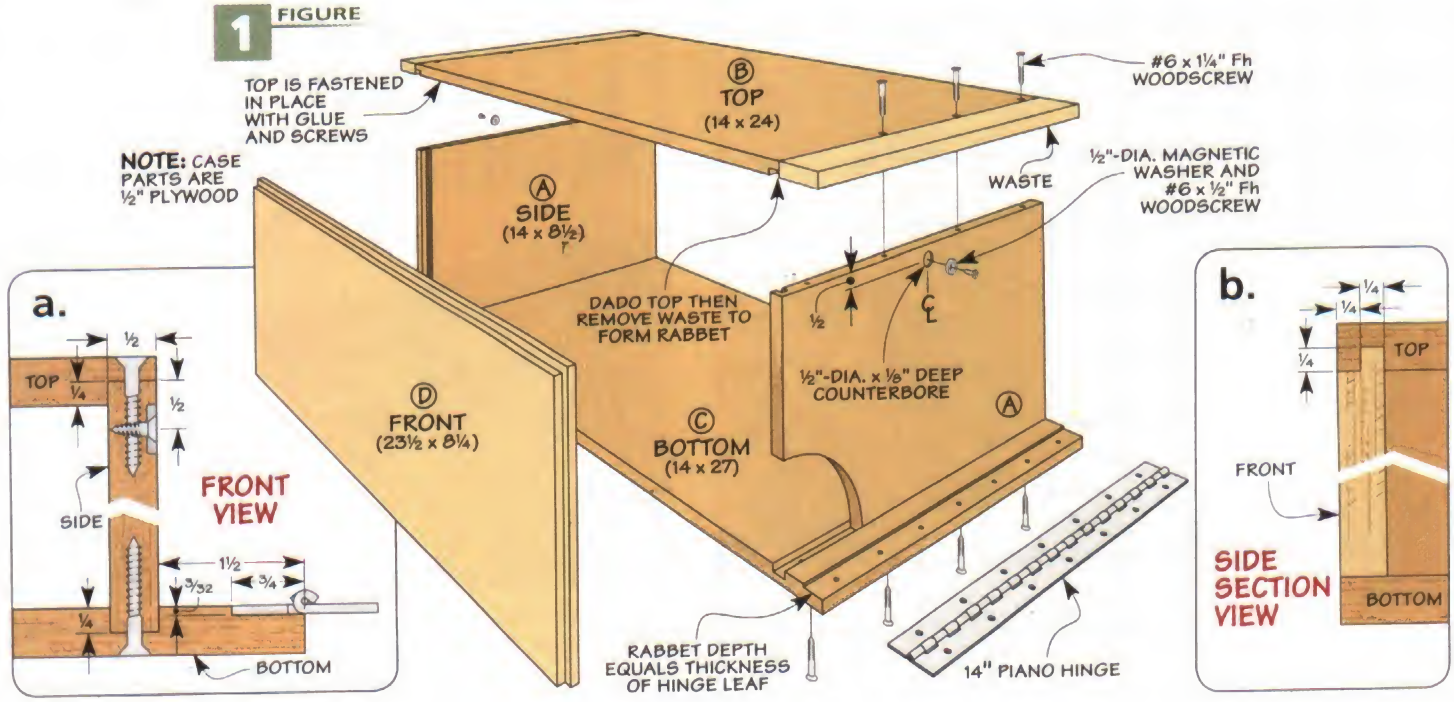
There are a couple of other things you need to do. First, the top needs a groove along the front edge to capture the front panel (Figure 1b). On the bottom, cut a shallow rabbet on each end for the hinges that will be attached later. (Here it's a good idea to have the hinges in hand so you can make sure the hinge leaf sits flush.)

Front. All you need to do to make the front panel is cut it to size, then rabbet the top and sides to create a tongue. Aim for a snug fit of the tongues in the grooves. Finally, you can assemble the case with glue and screws.

▲ ***Compact.*** *With the wings folded up and the jig inside, you can store the workcenter away.*

▲ ***Home Base.*** *The folding wing makes a handy spot to set your router when using your jig.*

FIGURE 1



FOLD-DOWN WINGS

With the shell of the case complete, you can start working on the hinged wings at each end.

If you take a look at Figure 2, you'll see that the wings have an opening in the center. These cutouts serve double duty. With the wings folded down, the cutouts make a convenient resting spot for your router. And when the wings are folded up, the cutout provides access to the carrying handle. You'll build the wings first, then fit the handles in the openings, as shown in Figures 2 and 3 at right.

Tray. The trays for the wings start with a piece of plywood with a center cutout. On top of that is a piece of hardboard with a larger opening sized to fit the base of your router. I cut all the pieces to size first and then cut the openings.

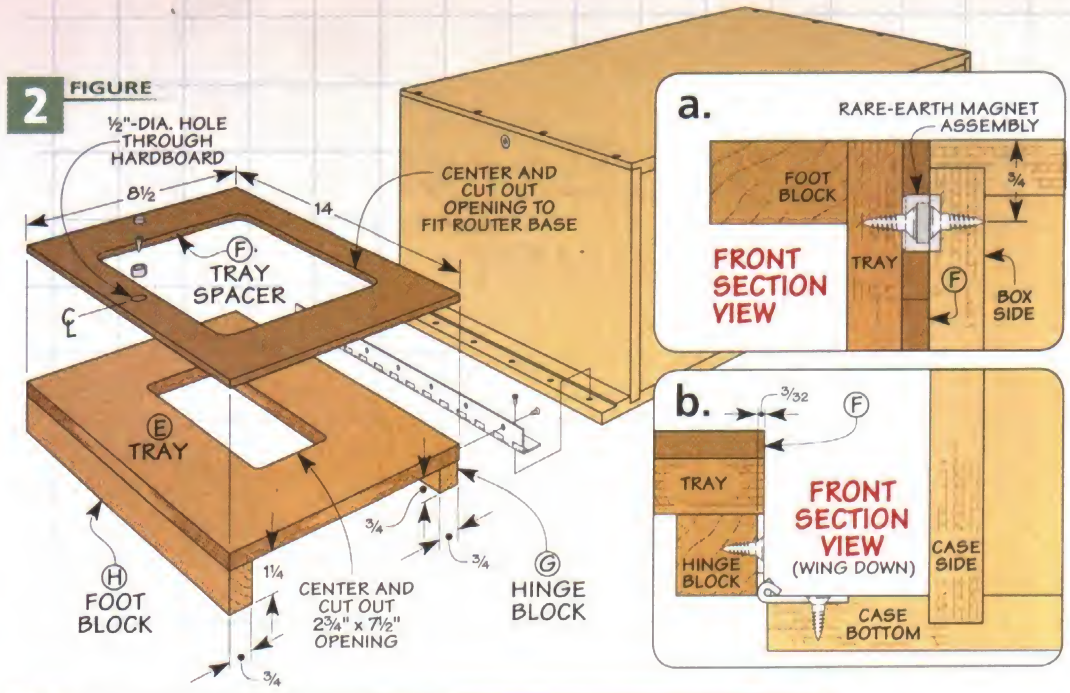
Cutouts. To make the cutouts, first drill a hole at each corner. A jig saw makes quick work of "connecting the dots" to remove the waste. With these pieces done, you can glue the hardboard to the plywood and move on to the hinge block and the foot that supports the tray when it's folded down.

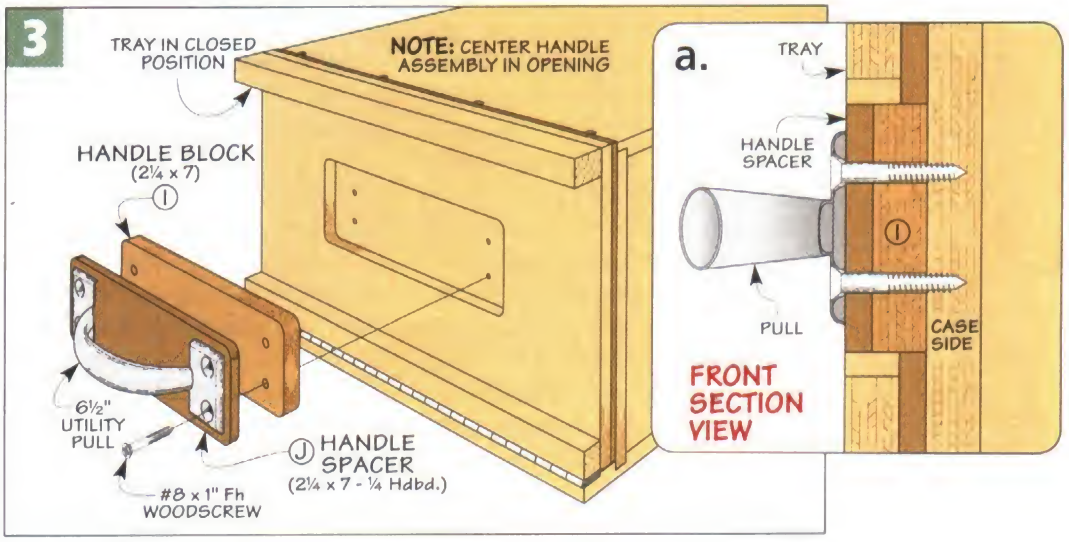
Hinge Block. The hinge block is where you'll attach one leaf of the hinge. The goal is to have the tray flush with the top of the case when the wing is in the upright position. I found it easiest to attach the hinge to the case bottom and the hinge block first. Then you can glue the block to the tray.

Foot Block. The foot block is sized so that the tray sits parallel to the bench when it's in the open position. Just cut the foot block to fit and glue it to the tray.

Final Steps. The last step to completing the wings is to install the rare-earth magnets and washers, as shown in Figure 2.

Handles. The handles fasten to a handle block and hardboard spacer (Figure 3). They fit inside the cutouts in the trays. I attached them while the wing was closed so I could position them properly. Finally, you can add the handle.





Materials & Hardware

CASE

A	Sides (2)	14 x 8½ - ½ Ply.
B	Top (1)	14 x 24 - ½ Ply.
C	Bottom (1)	14 x 27 - ½ Ply.
D	Front (1)	23½ x 8¼ - ½ Ply.
E	Trays (2)	14 x 8½ - ½ Ply.
F	Tray Spacers (2)	14 x 8½ - ¼ Hdbd.
G	Hinge Blocks (2)	¾ x ¾ - 14
H	Foot Blocks (2)	¾ x 1¼ - 14
I	Handle Blocks (2)	7 x 2¼ - ½ Ply.
J	Handle Spacers (2)	7 x 2 ¼ - ¼ Hdbd.
K	Front Stop Bars (3)	1½ x 20½ - ½ Ply.
L	Top Stop Bars (3)	3½ x 20½ - ½ Ply.
M	Adjustable Stops (4)	1½ x 2½ - ¼ Hdbd.
N	Drawer Front/Back (2)	7⅞ x 22⅛ - ½ Ply.
O	Drawer Sides (2)	7⅞ x 13¼ - ½ Ply.
P	Drawer Bottom (1)	12¾ x 22⅜ - ¼ Hdbd.

- (2) 6½" Utility Pulls
- (12) ¼" - 20 Threaded Inserts
- (2) 1½" Continuous Hinges, cut to 14" (w/screws)
- (2) ⅜"-dia. Rare-Earth Magnets w/ Cups, Washers, and Screws
- (2) ½"-dia. Rare-Earth Magnets w/ Cups, Washers, and Screws
- (26) #6 x 1¼" Fh Woodscrews
- (8) #8 x 1" Fh Woodscrews
- (12) ¼" Washers
- (8) Round Knobs with ¼" - 20 x 1" stud
- (4) Round Knobs with ¼" - 20 x 1½" stud

adding the

Support Bars & Drawer

Top Stop Bar. *Besides accurate positioning, the stop bar helps support the workpiece.*

▲ ***Adjustable Stops.*** *These stops help keep longer workpieces square in the jig.*

One of the best features of the workcenter are the two support bars (photos at right). They're sized to work in tandem with the clamping bars on your dovetail jig to help support the workpieces. And they include adjustable stops that help keep the workpieces aligned and square in the jig. There is one on the top behind the dovetail jig. And there's another on the front, below the jig. To help you size the support bars to your jig, now would be a good time to go ahead and mount the jig to the case.

Mounting the Jig. The easiest way to mount the jig is to center it along the top. Your jig may have a clamping bed that hangs down the front. Set this tight against the front face. Then all you need to do is mark the mounting hole locations for your jig and drill holes for threaded inserts. Before moving on to making the support bars, fasten the jig in place with round studded knobs (Figure 4).

Support Bars. For the support bars to work properly, they should be flush with the front and top clamping beds of the jig. So the height of the support bars will depend on your jig's dimensions.

There's an important thing to note here. Some dovetail jigs don't have a clamping surface that will extend past the front of the case as mine does (Figure 4). If that's the case with your jig, you can eliminate the front support bar.

Laminated Blank. To make the support bars, you'll start by gluing up three layers of ½" plywood (detail 'c'). I made my blank large enough to complete both the top and front stop bars.

The next thing to do is to size them to fit your jig. I used a scrap piece in the jig and cut the support bars so they fit snugly between the workpiece and the top of the workcenter. Finally, I cut two "ears" at the ends of the top bar that are used for attaching it to the jig.

Attach the Bars. Like the dovetail jig, the bars are attached to the workcenter with studded knobs and threaded inserts. Once you get the bars locked down tight, the box

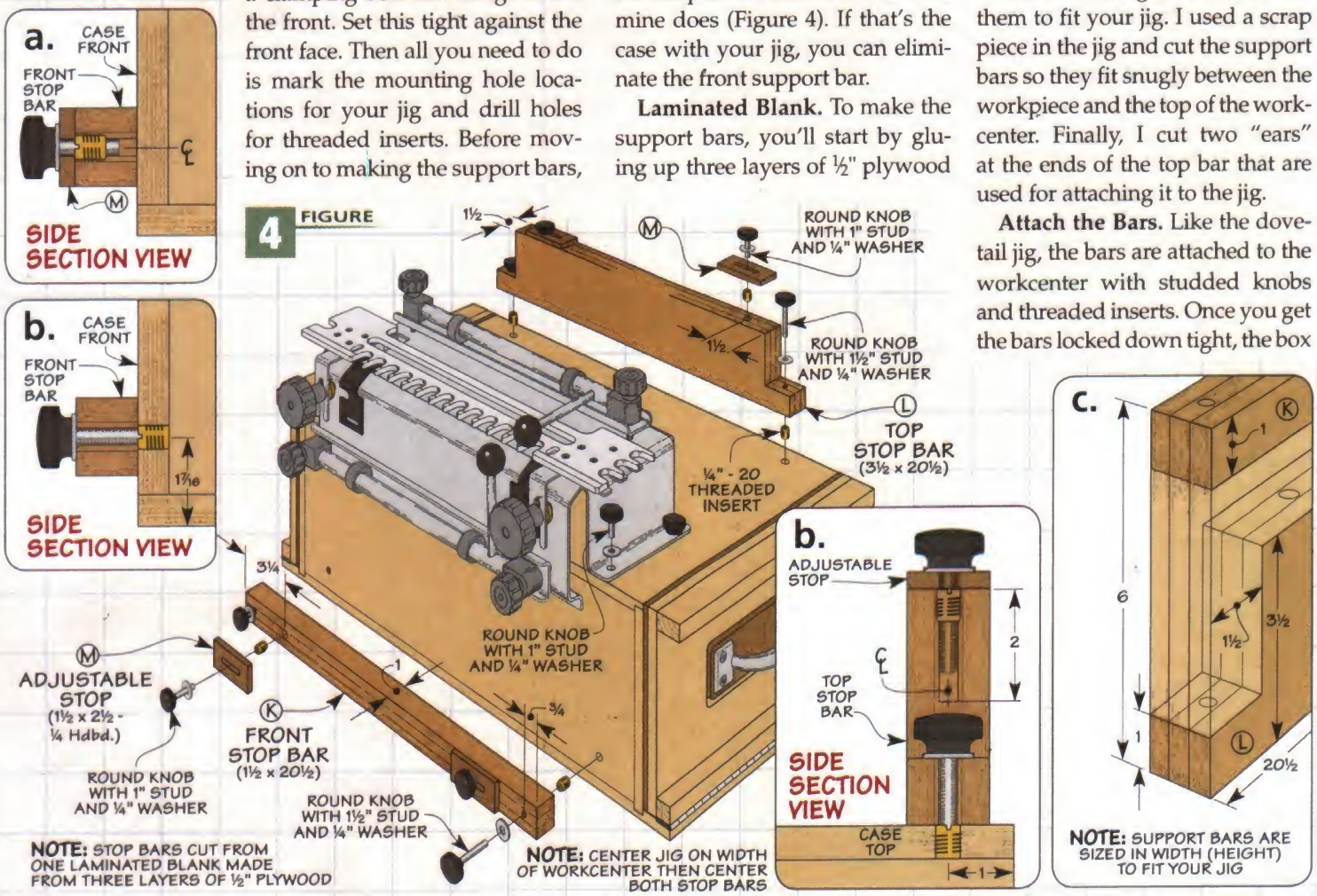


FIGURE 4

below will show you how to locate and attach the adjustable stops for your jig. Then you can move on to building the drawer.

DRAWER

The storage drawer slips into the back of the case. And it's large enough to store the jig, extra templates, support bars, and knobs. (Refer to the photo on page 37.)

Drawer Box. Before I cut the drawer sides to length, I measured the inside depth of the workcenter. The goal is to have the face of the drawer flush with the outside of edge of the case. I subtracted the thickness of a rare-earth magnet, cup, and washer since these will be fastened to the back of the drawer and case. (They will help hold the drawer closed.)

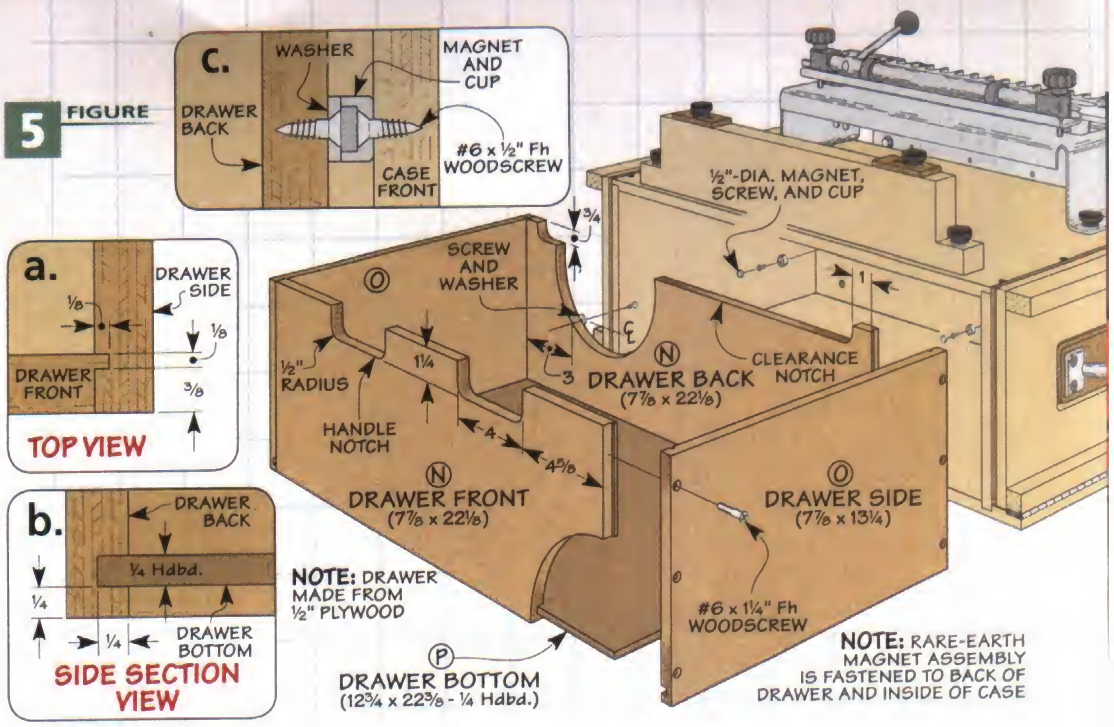
The drawer front and back are joined to the sides with tongue and dado joints reinforced with screws. After you cut the front and back pieces to size, cut a groove on all four pieces to hold the bottom of the drawer in place.

Notches. Before you glue everything together, you'll want to make the handle notches on the drawer front. And you'll need to form a long notch on the back. This provides clearance for the studded knobs that extend into the case when you attach the jig.

Magnet Catches. The last thing to do is attach the two rare-earth magnets that hold the drawer in the case. I installed the washers on the drawer back, then used them to locate the magnets inside the case, as you can see in Figure 5c.

A word of caution here. These magnets are pretty strong, but you should still be careful when the drawer is fully loaded and you're moving the workcenter around.

Final Wrap-Up. Now you're almost ready to go. Just clamp the workcenter securely to your bench, get everything adjusted, and start routing great-looking dovetails. (For some handy tips on routing half-blind dovetails, refer to page 34.) It won't be long before you appreciate how convenient and useful this workcenter is.

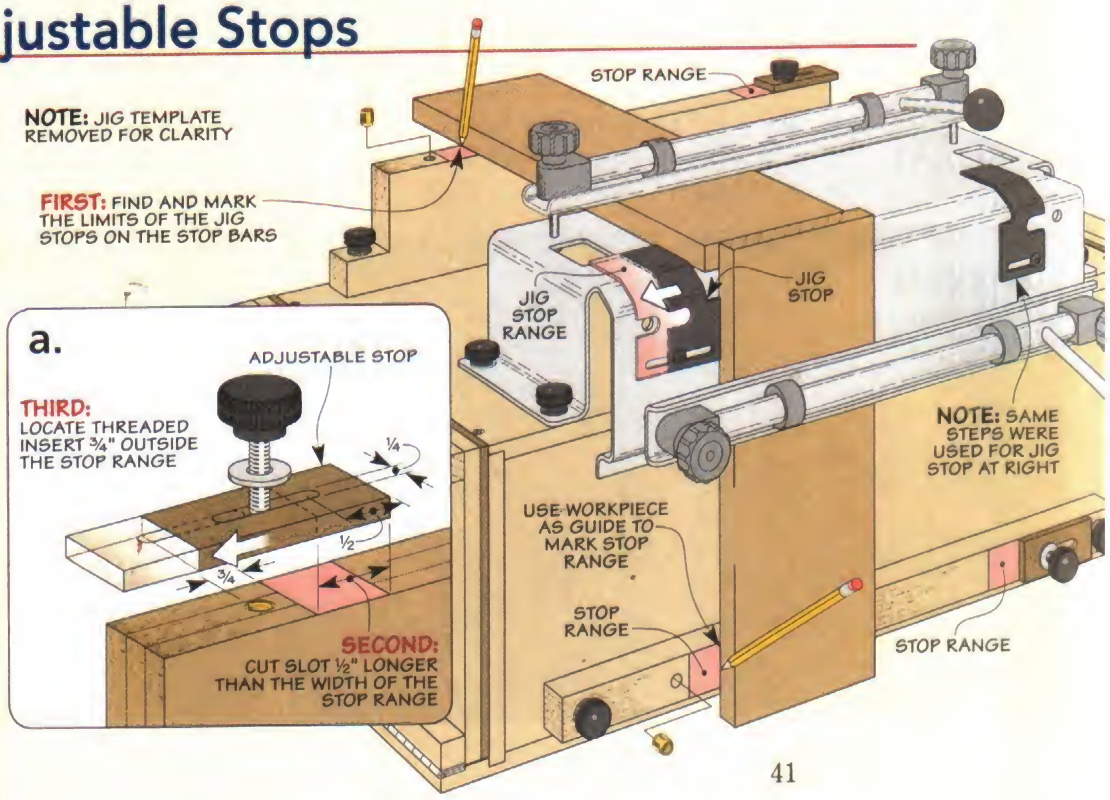


Locating the Adjustable Stops

Locating the adjustable stops on the support bars is a simple process. The first thing to do is find the range, or limits, of your dovetail jig's built-in stops. The drawing shows how I used workpieces clamped in the jig to do this. (You can also use a square.)

Once I had the range of my jig's adjustable stops marked on the support bars, I measured ¾" outside that range. This is where you can drill and install the threaded inserts. Then I cut a slot in the hardboard stop that was ½" longer than that range limit I marked on the support bars.

Now, with the adjustable stops installed, it's just a matter of aligning them with those on your jig.



easy maintenance for your Saw Blades

For better cuts and longer life, it makes good sense to take the best possible care of your table saw blades.

1 Removal & Installation

If you're like me, you have quite a bit of money invested in high-quality, carbide-toothed table saw blades. And to ensure they always give top-notch results, you need to care for them properly.

For the most part, this is pretty simple stuff. And it starts with the basic job of removing and installing a blade without damaging the brittle, carbide teeth. The trick to this is just following a set routine.

To remove a blade, I first lower it completely below the surface of the saw table. This allows you to easily remove the throat insert plate without bumping it against the teeth, as shown in photo A.

With the throat opening clear, you now want to raise the blade to give yourself better access to the arbor and arbor nut. Next, use a sturdy scrap to gently "jam" the teeth of the blade and prevent it from turning while you loosen the nut (photo B). Notice that I added a "bend" to the shaft of the arbor nut wrench (photo C). This keeps both the wrench and your hand away from the teeth.

After removing the nut and washer, carefully grab the blade with both hands and slowly work it off of the arbor shaft (photo C). It may take a light back and forth "wobble" to help move it along. When you reach the end of the shaft, gently ease the blade free and lift it out of the throat opening. Note: If the blade isn't going straight into storage, be sure to set it on a "soft" surface.

When you install a blade, you simply reverse the order of the steps. But note that to tighten the arbor nut, you'll need to jam the blade from the back of the saw. And try not to over-tighten the arbor nut, a light torque is all it takes. Finally, lower the blade, replace the throat insert plate, and your saw is back in business.

2 Keep It Clean

A blade that's free of the pitch and resin buildup will produce cleaner cuts and stay sharp longer. So for me, regular cleaning is a must.

For a long time, caustic oven cleaner was recommended for the job. Today there are less harmful options (refer to Sources on page 51). The idea is to spray both sides of the blade with cleaner and then give it five or ten minutes to work. The lid from a plastic five-gallon bucket makes a good tub (main photo at right).

Once the cleaner has done its job, all it takes is a little work with a non-abrasive scrub pad to remove the residue. A brass-bristle brush will make quick work of the hard-to-reach spots on the teeth and in the gullets (main photo at left). When all you see is bright, shiny surface, rinse the blade with water and dry it off thoroughly to prevent rust.

And finally, to reduce the friction that increases pitch and resin buildup, I complete the job by spraying the blade with a coat of lubricant (inset photo).

▲ *BEFORE*

◄ *AFTER*

3 When Do I Sharpen?

It can be hard to know when a blade needs to be sharpened. But there are a couple of indicators that help remove the guesswork.

The most obvious sign is a poor-quality cut. If you're getting rough cuts and burning from a clean blade on a well-tuned saw, dull teeth are the likely culprit.

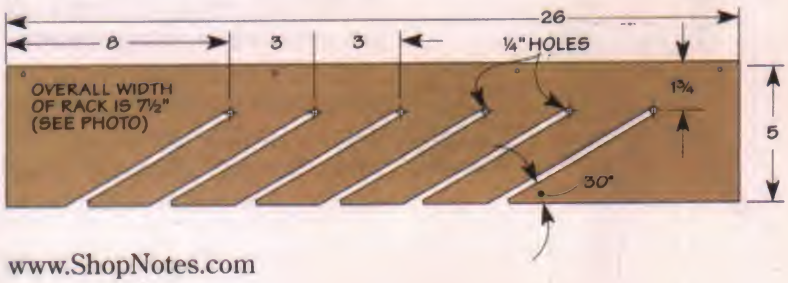
The second clue comes from a close inspection of the carbide tips under good light. All the edges and corners (beveled tips) should look sharp and crisp. A reflective line along the edges means they're getting rounded. And keep an eye out for minor chips, as in the main photo at left. Even a dull blade can feel sharp (and cut you), so I never judge with my fingers.

If your blade fails the tests, it's time to consider spending $15 to $20 for a professional sharpening. On the plus side, the blade will come back with razor-sharp teeth and cut like new (inset photo).

4 Safe Storage

Storing your blades safely is a simple, but important, component of a long, sharp life. The key here is to keep the blades (especially the teeth) away from any damaging surfaces and away from each other, but still within easy reach. A simple wall rack, like that shown in the photo at right, is the best answer that I've found.

Each blade has its own protective slot in this compact, plywood rack. The slots (cut with a jig saw) are widely spaced to make inserting or removing a blade safe and easy (drawing below).

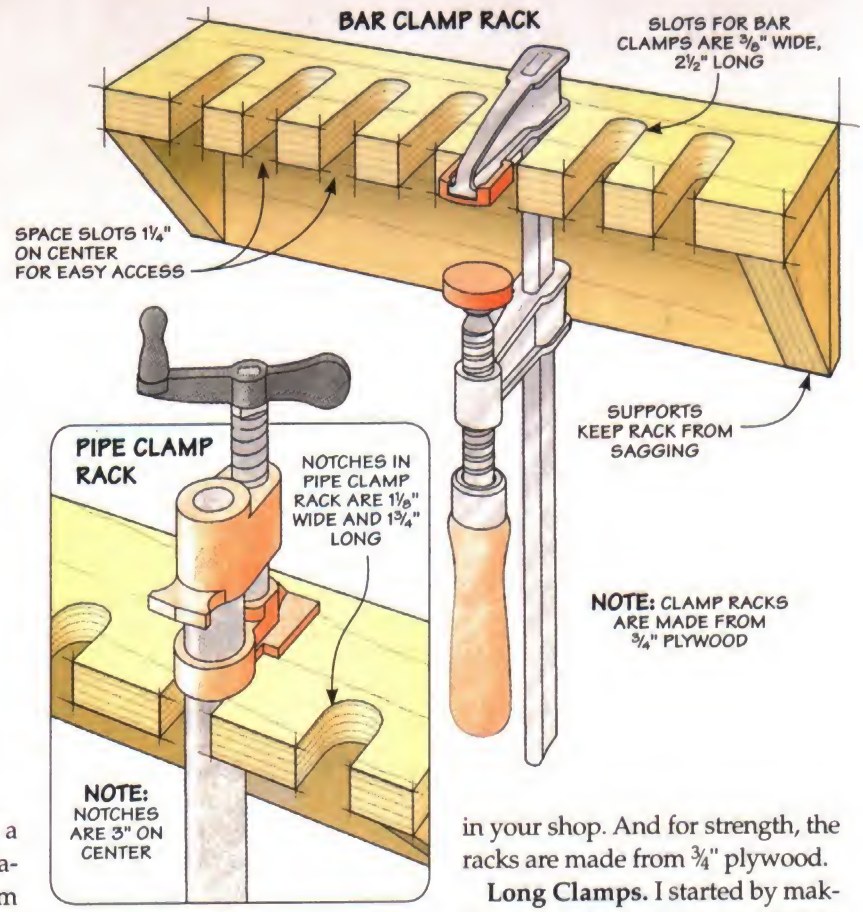


quick & easy Clamp Storage

Here are a few ideas to help you take control of your clamp collection.

Finding the clamps I need for a glueup used to be more like a treasure hunt. I'd find clamps from previous projects hiding in almost every corner of my shop.

So over time, I've come up with some handy ways for keeping my clamps organized and within easy reach. Take a look at these pages and I'm sure you'll be able to put these ideas to use in your shop.



SIMPLE CLAMP RACKS

The starting point for getting your clamps under control is the customized racks you see on this page. The idea is that each rack is made to hold a specific type of clamp. This allows you to quickly make more as your collection grows.

You'll also notice that each rack is fairly small. This way, you can easily tuck one just about anywhere in your shop. And for strength, the racks are made from 3/4" plywood.

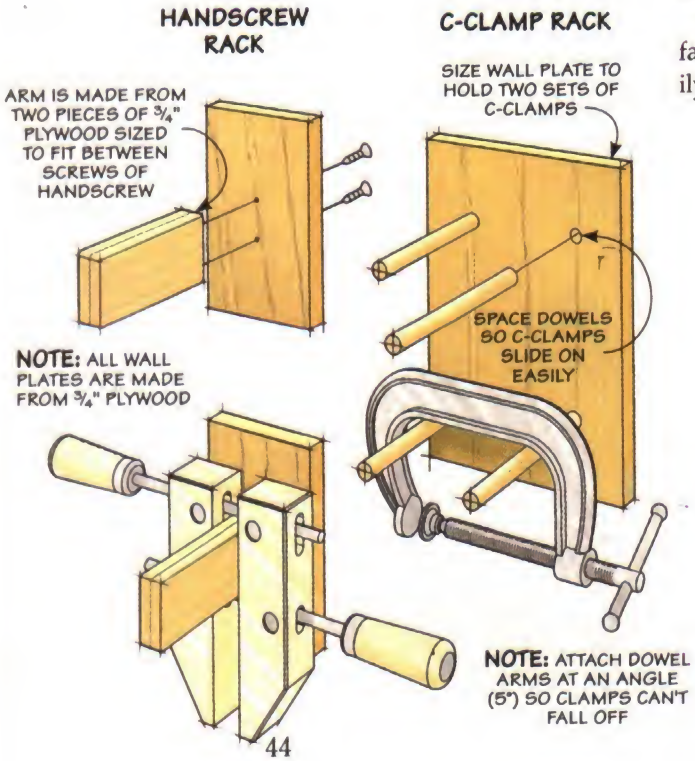
Long Clamps. I started by making racks for my bigger clamps — bar clamps and pipe clamps. A look at the drawings above will show you that these racks are simple, L-shaped shelves with a brace added on each end to support the weight of the long clamps.

Slots or notches are cut into the front of the shelf to create clearance for the pipes and bars. When spacing these openings, you'll want to provide enough room between them so the clamps aren't too crowded and difficult to grab.

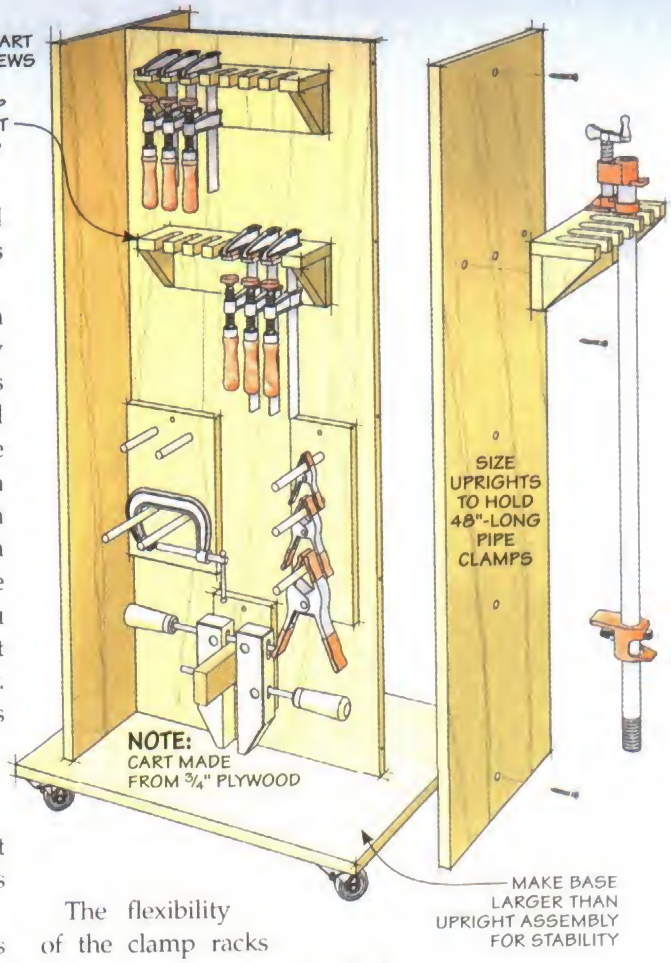
The shelves take care of the long clamps. But I find that smaller clamps are the ones that are more easily misplaced. The three rack ideas you see in the drawing at left provide simple ways to hang different types of small clamps.

Each one consists of a wall plate with an arm to hold the clamps. For different types of clamps, all you need to do is change the arm.

Handscrew Clamps. For example, to hold my wood handscrew clamps, I made a hefty arm from two pieces of plywood glued together. The width of the arm is



Roll-Around: Clamp Cart



Not every shop has enough spare wall space to store a large collection of clamps. And even if your shop does have the space, it doesn't mean that the clamps will be in a convenient location.

The solution to both of these challenges is the clamp cart shown at right. You'll be surprised at just how many of the clamp racks shown on the opposite page you can fit on it. The reason is the I-shape gives it a lot of vertical mounting space without taking up a lot of floor space.

Another benefit of having your clamps on a cart is that you can just roll it wherever you need it. This can save you some steps when assembling a project.

Construction. In keeping with the clamp racks, the cart is pretty easy to build. All the upright pieces are cut from ¾" plywood. And they're held together with glue and screws. This assembly is then attached to a base. Cut the base a few inches wider and longer than the upright assembly to give the cart plenty of stability. Then, you can attach swivel casters to the cart for maximum maneuverability. Finally, attach your clamp racks and set your clamps in place.

sized to fit between the screws, as you can see in the far left drawing. And I made it long enough to accept three or four handscrews.

C-Clamps. Another variation you can build is a rack for C-clamps (middle drawing on the opposite page). The main difference is that instead of one large arm, I used a pair of dowels. It's a good idea to angle the dowels up slightly (about 5°). This way the clamps can't "walk" off the rack.

Spring Clamps. The final rack I made holds spring clamps (lower right drawing on facing page). Here, you can hang several clamps from a single dowel. Then to really make the most of limited space, you can take advantage of the A-shape of the clamps and have different sizes "nest" over each other.

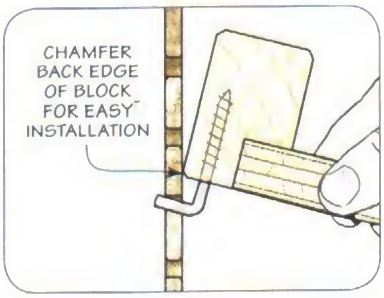
PUT THE RACKS TO WORK

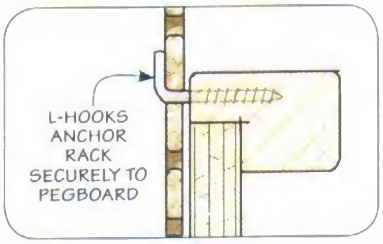
Once you have the racks built, the next thing to do is to hang them up. The easiest solution is to simply attach each rack to the wall.

Wall Organizer. However, with just a little more time and material, you can create a dedicated clamping area in your shop. With the wall organizer shown at right, you'll have everything you need for assembling a project without having to make a lot of trips across your shop gathering up clamps.

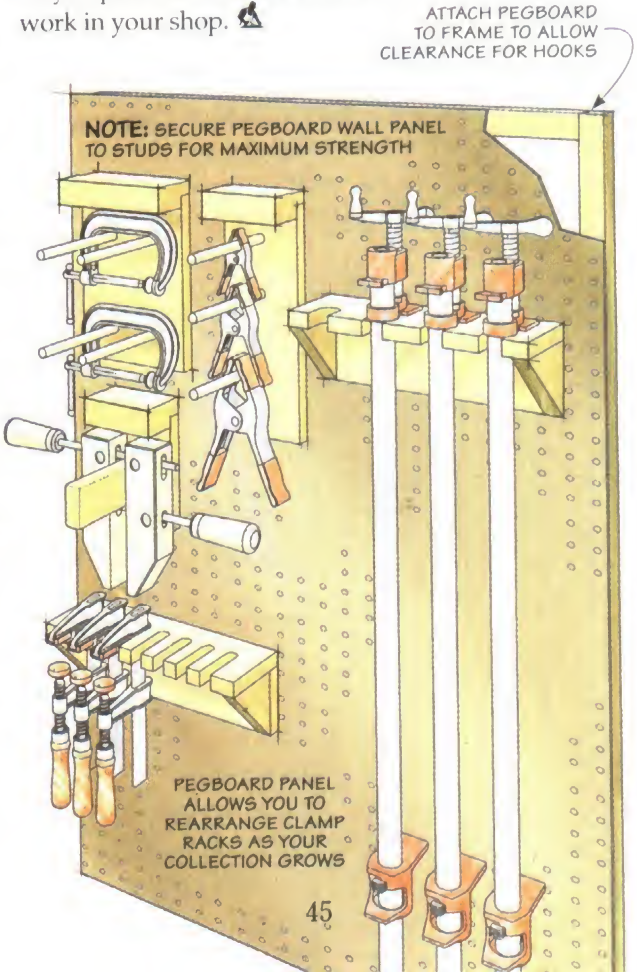
Versatile Pegboard. In this setup, I've attached the racks to a pegboard panel with hooks. Using pegboard allows you to reorganize your clamp racks to suit your needs without a lot of fuss.

The back of the panel is framed with furring strips to provide rigidity and clearance for the hooks. I hung the racks using ordinary L-hooks. And I added rabbeted hardwood blocks to provide enough material for the long threads to bite into.





The flexibility of the clamp racks shown here doesn't end with this arrangement. If you take a look at the box above, you can see another way to put these versatile racks to work in your shop.

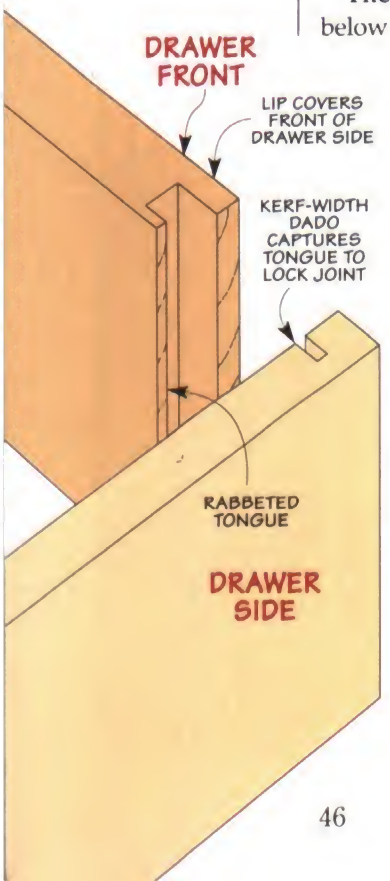


Cutting a Locking Rabbet Joint

For strong, easy-to-assemble drawers, you'll want to try a locking rabbet joint cut on the table saw.

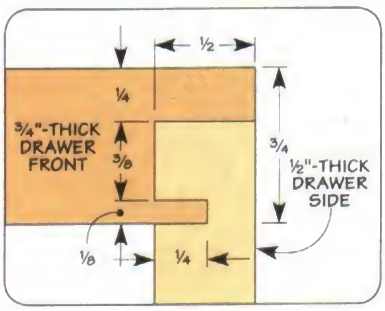
Besides handling basic rip cuts and crosscuts, your table saw is a great tool for cutting precision joinery. A good example of this is using locking rabbet joinery to build sturdy drawers. The entire job can be completed in short order without leaving the table saw.

The Anatomy. The drawing below shows how a locking rabbet fits together and why it's such an effective joint. In a nutshell, a rabbeted tongue is cut into each end of the drawer front and back. Then a dado, sized to fit the tongue, is cut into the drawer side. The result is a solid mechanical lock as well as good gluing strength. And to top it off, as you can see in the inset photo above, the appearance of the joint is unique.



The Pieces. A locking rabbet joint works best if the front and back are thicker than the sides. A thicker front gives you more material in which to cut the rabbeted tongue while still leaving plenty of thickness on the front lip. It also lets you create more separation between the end of the sides and the dado. This all comes together to make the joint stronger. For large drawers, ¾"-thick fronts and backs and ½"-thick sides are pretty standard. (For small drawers, ½"-thick fronts and backs and ⅜"-thick sides work well.)

When you cut the pieces to length, keep a couple of things in mind. The fronts and backs are cut to the width of the drawer opening, allowing for clearance. The sides are cut to the full depth of the drawer, minus the thickness of the front and back lip.



CUTTING THE JOINTS

Once all the drawer pieces are cut to size, you can start setting up the table saw. Since most of the work goes into accurately cutting the rabbeted tongues on the front and back, this is where I like to begin.

The First Cut. There are two steps involved in making the rabbeted tongue. The first is to cut a groove or slot along the end. The table saw setup for this task is shown in Figure 1. In ¾"-thick stock, I generally cut a ⅜"-wide groove that's positioned to leave a ¼"-thick lip and a ⅛"-thick tongue (a saw kerf's width), as shown in detail 'a' at left. And the depth of the slot needs to match the thickness of the drawer sides.

To make the cut, you'll need to stand the workpiece on end and pass it over the dado blade. A tall auxiliary fence and a featherboard help you with control while a backer board minimizes chipout.

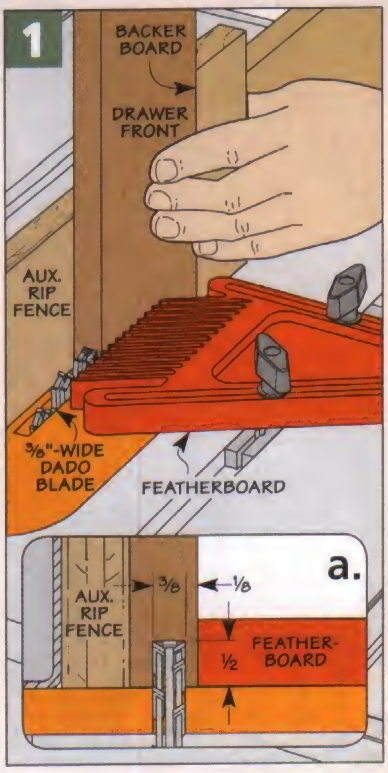
Test Cuts. As you can see, the setup for this cut (and the ones that follow) is pretty basic. But, the real key here is the accuracy of the setup. So before making any cuts on the actual workpieces, I always tweak things with the help of a few cuts on test pieces the same thickness as the actual parts.

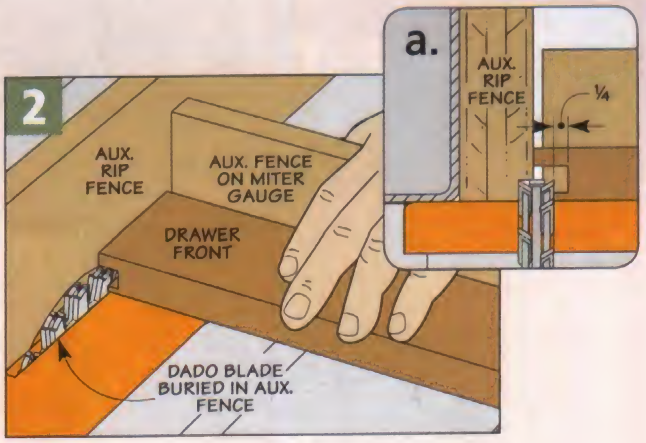
The Real Thing. Once your test cuts tell you the blade height and fence setting are dead on, you can cut the slots one after the other. The featherboard keeps the workpiece snug against the fence, so you just need to make sure it doesn't ride up on the dado blade.

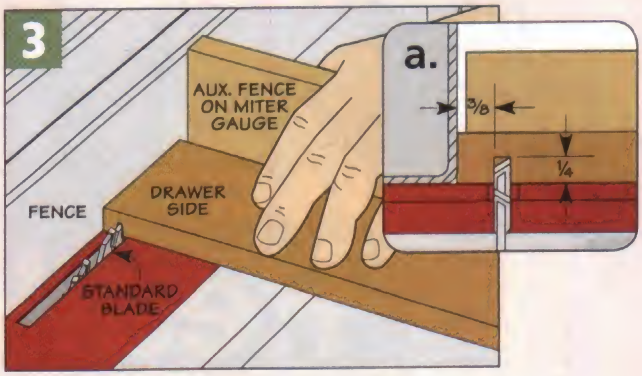
The Rabbeted Tongue. Cutting the groove leaves you with a narrow lip on the inside face of the workpiece. The next step is to cut back the lip to create the tongue, as shown in Figure 2 and in the main photo on the opposite page.

This task is pretty straightforward. You can use the same dado blade to make the cuts but now you'll need to bury it in the auxiliary fence. And an auxiliary fence attached to the miter gauge is used to feed and back up the workpiece. Your only real concern is cutting the tongue to the right length. Here again, a test cut or two is all it takes. A good rule of thumb is to cut the length of the tongue to half the thickness of the sides.

The Dadoes. After this second step is completed, you can set the fronts and backs aside and turn you attention to the sides. This final step is cutting the dado in the side that will capture the tongue and create the "lock." The setup I use here is shown in Figure 3. The main difference is that you'll need to switch to a standard, ⅛"-kerf blade on the saw.







This final cut determines how well the joint fits, and there are a few things to consider. First, the depth and width of the dado needs to match the size of the tongue. Finally, the dado needs to be positioned properly so that the end of the side fits snugly, but not too tightly, into the rabbeted front and back. This may sound like a lot to ask, but again a few test cuts are all it takes to get it done.

Once you've adjusted the setup, the cuts go pretty quickly. Just be certain to keep the workpiece tight against the rip fence and flat against the table.

Assemble the Pieces. That's it for the joinery. Once you've cut the grooves to hold the bottom, you can assemble the drawer. The mechanical lock of the joint makes this easy. You just need to apply enough side-to-side clamping pressure to pull things tight.

In my shop, the locking rabbet cut on the table saw is a mainstay. But there are times when you might want to call on the simpler joint shown below.

A Simpler Option: Tongue & Dado

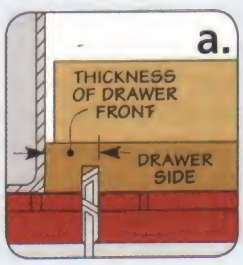
A close "cousin" to a locking rabbet is the tongue and dado joint, shown in the photo at right. It has similar advantages and is a great option for drawers that will use metal slides and be covered with a false front.

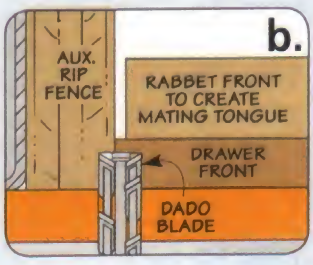
How-To. In this simpler joint, the false front creates the front lip that hides the end of the sides. So all you need to do is cut a dado in the sides and then cut a mating tongue in the identical thickness front and back.

The main difference in the technique used to make this joint is the order of things. As shown in detail 'a,' I like to cut the dado in the side piece first. This is just a single, kerf's-width cut with a standard blade.

The mating tongue is then created by rabbeting the end of the front (and back) using a dado blade, as shown in detail 'b.' Here, the key is to carefully match the thickness of the tongue to the width of the dado.

Tongue and Dado. *This joint is a great option for drawers using metal slides and a false front.*





GREAT Gear

add-on Digital Readouts

Get readability and digital accuracy by upgrading to these electronic accessories.

Accurate measurements are a must when building any project. And if you can read them easily, it's a plus. So, when a company called *Wixey* came along with a way to do both, I decided to take a look.

Wixey has developed a pair of digital readouts: one for the table saw and another for the thickness planer (refer to Sources on page 51). They even have a portable gauge that can accurately measure angles for almost any tool (box at bottom of opposite page).

Easy to Read. The main thing I like about these products is how easy they are to read. You don't have to be directly over a hairline indicator to get an accurate measurement or bend over to get a rough idea of the thickness you're planing a workpiece to.

For my table saw, I could accurately set my fence even when I was standing off to the side. And when it came time to plane a couple boards, I didn't need to get out my caliper to check the thickness. The display showed me exactly what the thickness of my workpiece was. So in both cases, the *Wixey* readouts eliminate any of the guesswork.

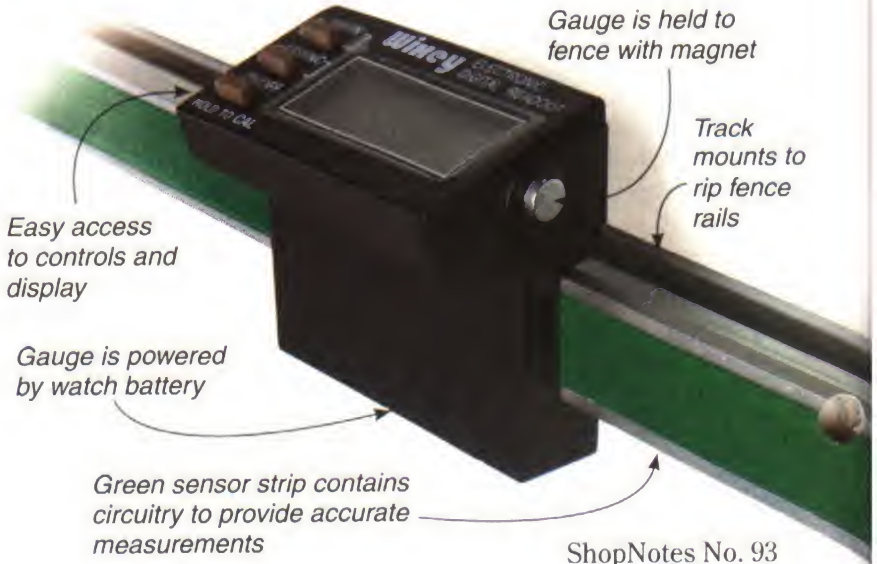
Accuracy. As for accuracy, the digital readouts let you know a measurement to a hundredth of an inch. Plus, when the readout is within 0.002" of a fractional equivalent, it "pops up" with the exact fraction down to 1/32".

TABLE SAW

Besides accuracy and readability, the *Wixey* add-on for your table saw has something else going for it. It's easy to install and calibrate.

For the installation, you'll need to assemble a pair of tracks into a single, 5'-long rail. Note: If necessary, you can trim the track with a hack saw to fit your saw.

Circuitry. After assembling the track, you'll apply two sensor



strips (bottom photo on opposite page) that contain the circuitry that allows the gauge to provide an accurate measurement. Then all that's left to do is slide the gauge onto the track and mount the assembly to your saw. Brackets supplied in the kit make this a snap, although you may need to drill mounting holes in some rails.

Magnets. At this point, you might be wondering how the gauge actually connects to your fence. To accomplish this, there's a magnet on either side of the gauge to "lock" it to the fence (main photo on opposite page). This way, you can use it with your fence on either side of the saw blade.

Calibration. Once the readout is attached, it's ready for calibration. Simply slide the fence until it just touches the blade. After holding the calibration button until the display reads zero, you're ready to go.

This simple calibration comes in handy when you use an auxiliary fence as well. After installing the auxiliary fence, simply recalibrate the gauge the same way.

Fence Removal. One thing you won't need to worry about is recalibrating the gauge when you remove the fence. Because the gauge maintains its calibration, removing and then reconnecting it to the fence isn't a problem.

THICKNESS PLANER

While having a digital gauge on a table saw is handy, having one for a planer is even more helpful. It clearly shows the thickness of a board being planed, unlike many planers where you really need to check the thickness with a caliper.

When you open the kit for the planer, you'll see that the gauge comes attached to a vertical sliding scale. The scale is set in a bracket that mounts to the body of the planer and a second bracket secures the gauge to the cutterhead. This allows the gauge to slide along the scale to indicate the thickness as the cutterhead moves up and down.

Installation. The first step in installing the gauge is to level the bottom of the vertical scale bracket with the bed of your planer using a supplied adjustment screw.

Then, using double-stick tape supplied with the kit, attach the scale to the planer (photo above). When that's done, you'll need to remove your planer's depth scale and connect the gauge to it using a bracket in the kit.

▲ ***Thickness Readout.*** *The easy-to-read display shows inches, fractions, and millimeters.*

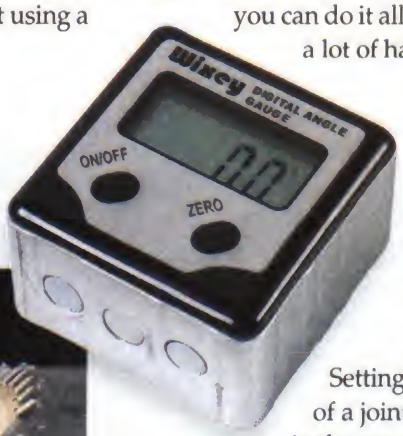
With the installation complete, the gauge is ready for calibration. The first step is to plane a board smooth. (The actual thickness of the board isn't important at this point.) Then, without readjusting the cutterhead, raise the vertical scale and place the board underneath. Finally, press and hold the calibration button until the gauge reads zero. At this point, the planer is ready to go to work with "built-in" accuracy.

These gauges are a great way to improve the accuracy, readability, and speed in setting up a table saw or a planer. And what's really nice, you can do it all without a lot of hassle.

Multi-Use: Portable Readout

▲ ***Set the Calibration.*** *Set the gauge on the flat surface of the tool and "zero" it out.*

▲ ***Set the Angle.*** *With the gauge on the blade, adjust the blade to the angle you want.*



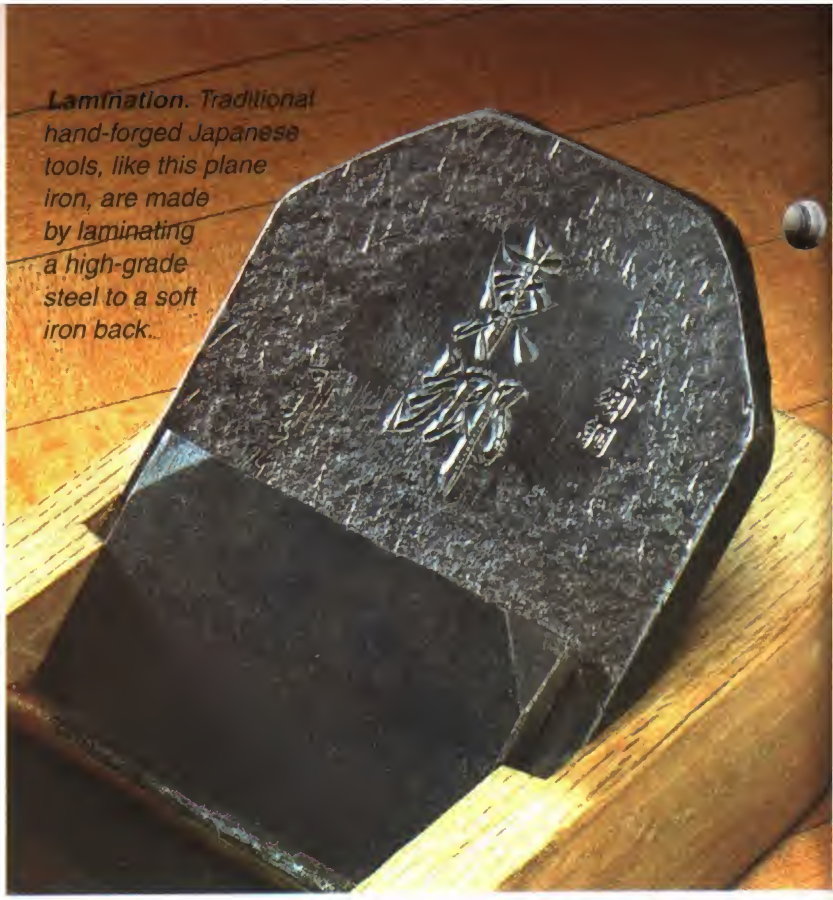
◄ ***Magnetic.*** *This gauge can be attached to any magnetic surface to find an angle.*

Setting the blade angle or the fence of a jointer, band saw, or miter saw is always a challenge. But for $40, you can get the *Wixey Digital Angle Gauge* pictured here that makes the task easy and virtually foolproof.

All you need to do is calibrate the gauge to the bed of the tool, then simply move it to your blade or fence and adjust it to the correct angle. This readout is accurate to $\frac{1}{10}°$. And, as long as there's a magnetic surface to attach this gauge to, you'll be able to find the angle you need quickly and accurately.

questions from
Our Readers

white vs. blue Japanese Steels



Lamination. *Traditional hand-forged Japanese tools, like this plane iron, are made by laminating a high-grade steel to a soft iron back.*

I'm interested in purchasing a set of Japanese chisels. But the difference between "white steel" and "blue steel" is a little confusing. Is one type better than the other?

Bob Asternak
Milwaukee, Wisconsin

The "white" and "blue" designations refer to two types of steel that are commonly used in the making of Japanese plane irons and chisels. But they don't actually refer to the color of the steel.

There's an interesting story behind the origin of these names. Much of the steel used by Japanese toolmakers is produced by *Hitachi Metals* in Japan. Like most steel companies, *Hitachi Metals* produces several alloys of steel for specific purposes. To help distinguish the different alloys from one another, they were wrapped in different colors of shipping paper.

The two types of steel used most often by toolmakers have become known as *"shirogami hagane"* (white paper steel) and *"aogami hagane"* (blue paper steel). High-quality tools are made from both types. And neither one is inherently "better" than the other. But there are some minor differences.

Added Elements. Both white and blue steel are "high-carbon" tool steels. The difference between the two is in the other elements that are added to the steel. White steel is a simple carbon steel. But blue steel also has the elements tungsten and chromium added to it to increase the steel's ability to retain an edge and resist rusting.

Hardening. Another key difference between white and blue steel is the way in which each is hardened. White steel is hardened by quenching in water, and it has a fairly narrow temperature range at which this can be done. So white steel requires more skill on the part of the toolmaker.

Blue steel is hardened by quenching in oil after heating. Since blue steel has a wider temperature range for hardening, it is easier for a tookmaker to work.

Differences. From a practical woodworking standpoint, the difference between blue steel and white steel is very slight. White steel is said to be a little bit easier to sharpen. And due to the fineness of the molecular structure, it will take a slightly sharper edge.

A tool made from blue steel will hold an edge a little longer than one made from white steel, but not indefinitely. It will also be a little less prone to rust.

But be aware that these differences are subtle, and something you may not even notice until after spending a fair amount of time using and comparing tools made from both types of steel.

It's also important to keep in mind that the type of steel used is only *one* ingredient in the overall quality of a tool. The skill and experience of the toolmaker is a much more important factor than what "color" steel is used to make the tool.

Sources

ROUTER ACCESSORIES

Just about every woodworking store or mail-order source carries the hand-held router accessories (or similar items) shown on pages 10 to 13. The item numbers for those accessories available from the *Woodsmith Store* are:

Router Mat (265652)
Depth Gauge (338218)
Vacuum Attach. (216900)
Offset Baseplate (226581)
Guide Bushing Set (226230)
Circle-Cutting Jig (226540)

Some items, like edge guides or alternate bases, may be specific to the brand of router. In those cases, it's best to check with the manufacturer for accessory items available for their specific router models.

LAZY SUSANS

The lazy Susan bearings shown on page 12 are available at most hardware stores and home centers. But if you want a specific size or style, the margin lists a number of sources.

PLUG CUTTERS

A woodworking store or mail-order source is your best bet for locating plug cutters like the ones shown on page 14. Here again, the margin lists a number of sources.

PLYWOOD PROJECTS

You'll find very little hardware is needed to build any of the plywood projects starting on page 16. So you may be able to find everything you need locally. The 2" window locks for the assembly table came from *Home Depot*.

If you can't find some of the items locally, *Rockler* (see margin at right) may have what you need. For the roll-around cart, I used a set of 5" locking swivel casters from *Rockler* (31845). *Rockler* also carries the L-shaped shelf pins (33860), the corner braces (33605), and the piano hinge (30085).

OUTFEED SUPPORT

The table saw outfeed support on page 30 is a handy project for any workshop. And the nice thing is it doesn't take long to build and won't set you back much for the required materials and hardware.

I was able to pick up the hinges, woodscrews, and plastic laminate (*WilsonArt* D90-60) at a local home center. You should be able to pick up the steel flat stock for making brackets for a tube-style fence there as well. Finally, I ordered the leveling feet (62805K33) and threaded inserts (90016A030) from *McMaster-Carr*. Their contact information is listed in the margin.

DOVETAIL WORKCENTER

Building the dovetail workcenter shown on page 36 will take a bit of hardware. You should be able to find the washers, woodscrews, threaded inserts, handles, and piano hinges at just about any hardware store.

For the two different-length knobs (1373T57, 1373T58), I turned to *McMaster-Carr* (see margin). And *Lee Valley* has all the magnet hardware. The part numbers for the ⅜" magnets are 99K3203 (magnet), 99K3252 (cup), and 99K3262 (washer). The item numbers for the ½" size are 99K3103, 99K3253, and 99K3263, respectively.

Note: If you want to center the baseplate and bushing on your router, the *Woodsmith Store* carries the *Bosch* centering cone (269068).

DIGITAL ADD-ONS

The digital add-ons featured on page 48 are all made by *Wixey* (margin at right). The digital readout for the rip fence (WR700, $150) works best with T-square style fences, but can be adapted to tube-style models.

The planer gauge (WR500, $60) works on a wide range of models. And finally, the angle gauge (WR300, $40) isn't specific to a tool, so it's handy for the table saw, miter saw, jointer, or band saw.

MAIL ORDER SOURCES

Woodsmith Store
800-444-7527
Bosch Centering Cone, Casters, Lazy Susans, Plug Cutters, Rare-Earth Magnets, Router Accessories, Saw Blade Cleaner, Wixey Digital Add-Ons

Rockler
800-279-4441
rockler.com
Corner Braces, Lazy Susans, Piano Hinges, Plug Cutters, Rare-Earth Magnets, Roller Bearings, Router Accessories, Saw Blade Maintenance Kit, Shelf Pins, Wixey Digital Add-Ons

Lee Valley
800-871-8158
leevalley.com
Lazy Susans, Plug Cutters, Rare-Earth Magnets, Router Accessories, Saw Blade Cleaner

McMaster-Carr
630-600-3600
mcmaster.com
Knobs, Lazy Susans, Leveling Feet, Threaded Inserts

McFeely's
800-443-7937
mcfeelys.com
Montana Brand Plug Cutter

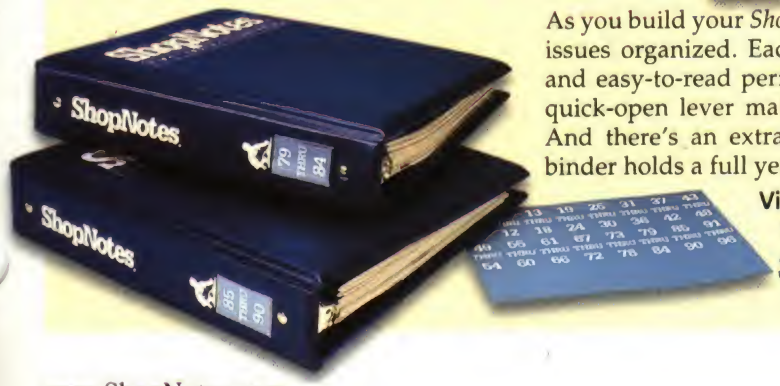
Woodcraft
800-225-1153
woodcraft.com
Lazy Susans, Router Accessories, Wixey Digital Add-Ons

Highland Hardware
800-241-6748
highlandwoodworking.com
Plug Cutters, Router Accessories, Saw Blade Cleaner, Wixey Digital Angle Gauge

Wixey
wixey.com
Digital Add-Ons

ShopNotes Binders

Keep your issues organized!



As you build your *ShopNotes* library, here's a way to keep your issues organized. Each binder features durable vinyl covers and easy-to-read perforated number tags. Snap rings with a quick-open lever make it easy to insert and remove issues. And there's an extra pocket inside for storing notes. Each binder holds a full year (6 issues) of *ShopNotes*.

Visit **www.ShopNotes.com** to order these binders, or call **1-800-444-7527**.

ShopNotes **Binder**
❍ **701950-SN93** (*Holds 6 issues*).....$12.95

Scenes from the Shop

Tired of stooping over to rout dovetails? The workcenter shown on page 36 takes your jig to a whole new level. Plus, you'll get some much-needed storage and added workpiece support — all in a compact, portable design.

You don't need to buy a whole new set of tools to get digital precision — just a few simple add-ons. Turn to page 48 and you'll find out how to add 21st-century accuracy to your power tools.

We'll show you how to make screwheads disappear. All it takes is a plug cutter and the right technique. Turn to page 14 for the step-by-step details.

Cutting Diagram

portable dovetail jig **Workcenter**

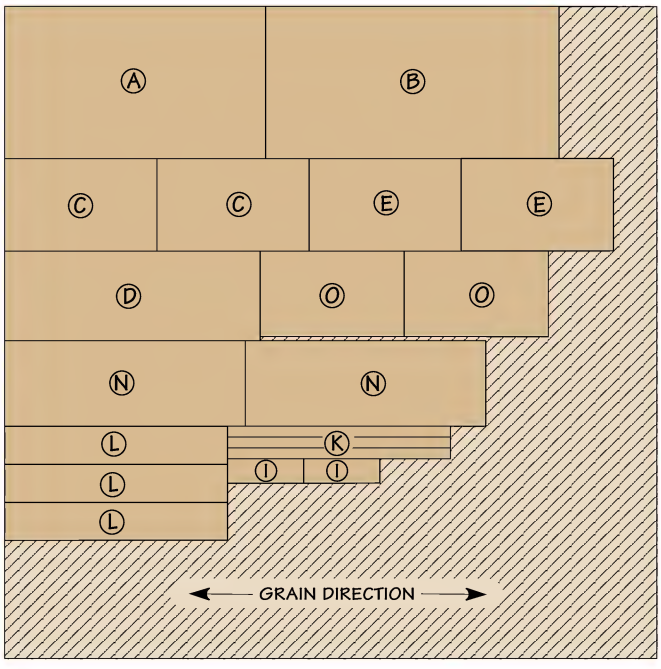
Materials

CASE

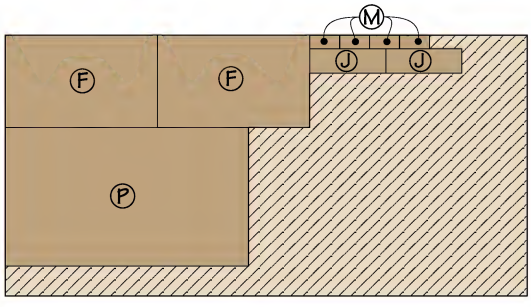
A	Top (1)	14 x 24 - ½ Ply.
B	Bottom (1)	14 x 27 - ½ Ply.
C	Sides (2)	8½ x 14 - ½ Ply.
D	Front (1)	8¼ x 23½ - ½ Ply.
E	Trays (2)	8½ x 14 - ½ Ply.
F	Tray Spacers (2)	14 x 8½ - ¼ Hdbd.
G	Hinge Blocks (2)	¾ x ¾ - 14
H	Foot Blocks (2)	¾ x 1¼ - 14
I	Handle Blocks (2)	7 x 2¼ - ½ Ply.
J	Handle Spacers (2)	7 x 2 ¼ - ¼ Hdbd.
K	Front Stop Bars (3)	1 x 20½ - ½ Ply.
L	Top Stop Bars (3)	3½ x 20½ - ½ Ply.
M	Adjustable Stops (4)	1¼ x 2¾ - ¼ Hdbd.
N	Drawer Front/Back (2)	7⅞ x 22⅛ - ½ Ply.
O	Drawer Sides (2)	7⅞ x 13¼ - ½ Ply.
P	Drawer Bottom (1)	12¾ x 22⅜ - ¼ Hdbd.

- (2) 6½" Utility Pulls
- (12) ¼" - 20 Threaded Inserts
- (2) 1½" Continuous Hinges, cut to 14" w/screws
- (2) ⅜"-dia. Rare-Earth Magnets w/Cups, Washers, and Screws
- (2) ½"-dia. Rare-Earth Magnets w/Cups, Washers, and Screws
- (26) #6 x 1¼" Fh Woodscrews
- (8) #8 x 1" Fh Woodscrews
- (12) ¼" Washers
- (8) Round Knobs with ¼" - 20 x 1" stud
- (4) Round Knobs with ¼" - 20 x 1½" stud

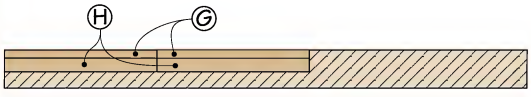
NOTE: Grain direction on some parts may differ from project shown in ShopNotes No. 93



60" x 60" - ½" BALTIC BIRCH



24" x 48" - ¼" HARDBOARD



¾" x 3½" - 48" HARDWOOD

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